R710

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A.2 Explanation of Node

A.2.1 Front side

(1) Location of the switches

- Power Button and Power Indicator
  Figure A.2.1.1-1 shows the location of power button and the power indicator.
  The power lamp in the description indicates the power indicator.

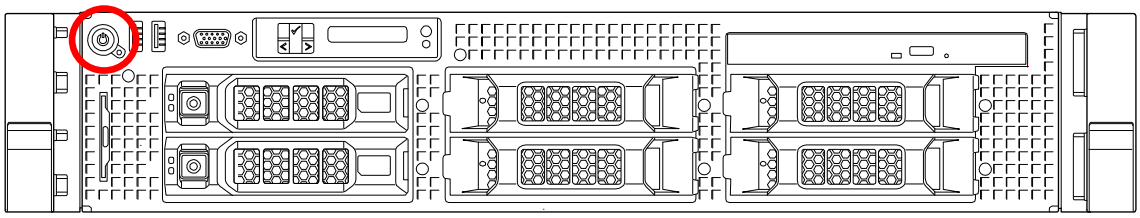

Figure A.2.1.1-1 Power Button and Power Indicator

- NMI button
  Figure A.2.1.1-2 shows the location of NMI button.
  NMI issue is executed by pressing NMI button.

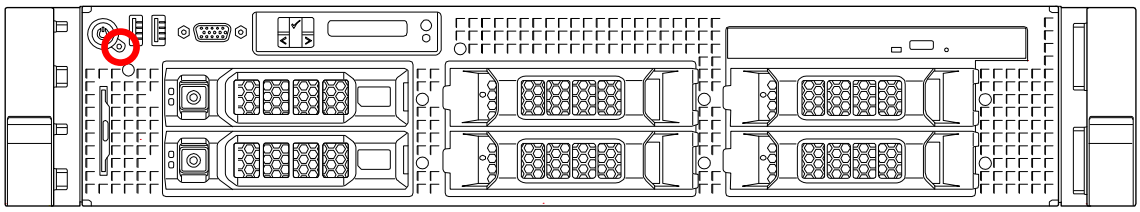

Figure A.2.1.1-2 NMI button

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A.2.2 Back side

A.2.2.1 Power source unit

Table A.2.2.1-1 shows the LED display status of the power source unit. For the location of the power source unit, refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual".

Table A.2.2.1-1 LED display status of the power source unit

#	LED display status	Status
1	Turn off	No AC power supplied.
2	green light	Power source unit is running.
3	yellow light	Failed the power source unit.
4	blinking in green and yellow one after the other	The level of wattage does not match with the other side power source unit.

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A.2.2.2 Port arrangement and port names

(1) Node in the cluster configuration
Figure A.2.2.2-1 shows the port names on the backside of a node.
When the maintenance tool is used, the port name of the diagram is shown.
'Table A.2.2.2-1 Confirmation Table for the Port Allocation of Node' shows the correspondence between the port names displayed on the maintenance CLI (names on the OS) and the actual port positions of a node.

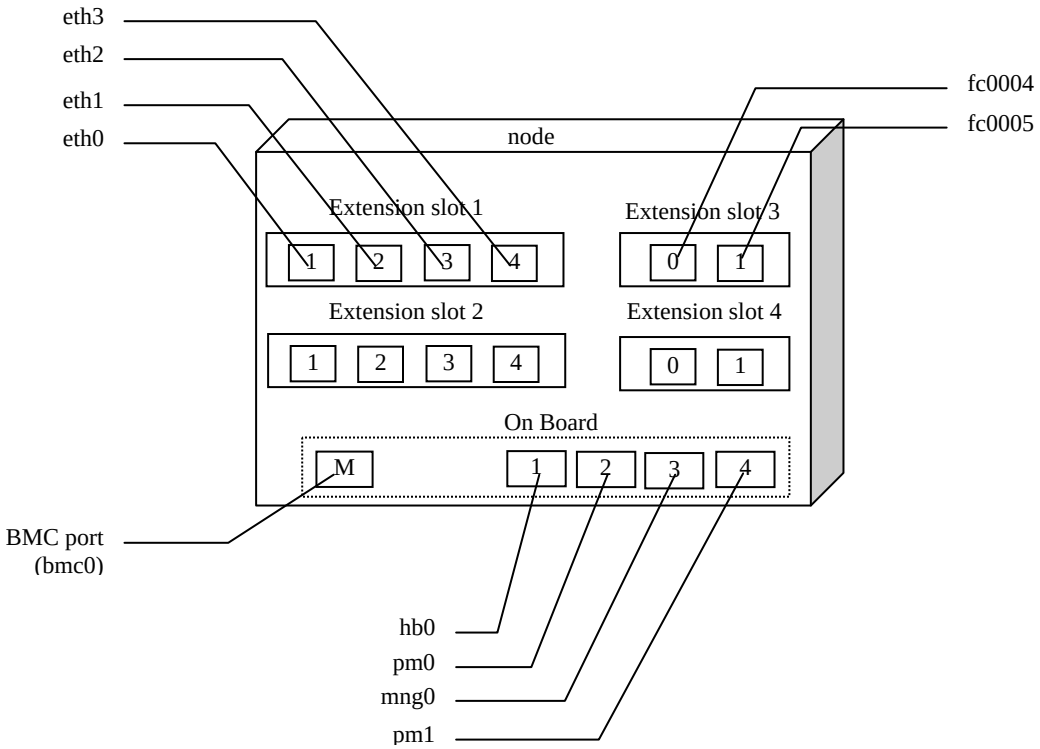

Figure A.2.2.2-1 Rear View of the Node

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Table A.2.2.2-1 Confirmation Table for the Port Allocation of Node

#	Position	Port position	Interface name	Application	Remarks
1	On-board	1	hb0	heartbeat port	—
2		2	pm0	Private Maintenance port	—
3		3	mng0	Management port	—
4		4	pm1	Reserved port (unused)	—
5		M	bmc0	BMC	—
6	Extension slot 1	1	eth0	data port	PCI-Express 2.0<×4>
7		2	eth1	data port	
8		3	eth2	data port	
9		4	eth3	data port	
10	Extension slot 2	1	eth4	data port	PCI-Express 2.0<×4> * Not supported
11		2	eth5	data port	
12		3	eth6	data port	
13		4	eth7	data port	
14	Extension slot 3	0	fc0004	Connecting an FC port and the disk array subsystem or the tape drive	PCI-Express 2.0<×8>
15		1	fc0005	Connecting an FC port and the disk array subsystem or the tape drive	
16	Extension slot 4	0	fc0006	Connecting an FC port and the disk array subsystem or the tape drive	PCI-Express 2.0<×8> * Not supported
17		1	fc0007	Connecting an FC port and the disk array subsystem or the tape drive	

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(2) Node in the single node configuration
Figure A.2.2.2-2 shows the port names on the backside of a node.
When maintenance tool is used, the port name of the diagram is shown.
Table A.2.2.2-2 shows the correspondence between the port names displayed on the maintenance CLI (names on the OS) and the actual port positions of a node.

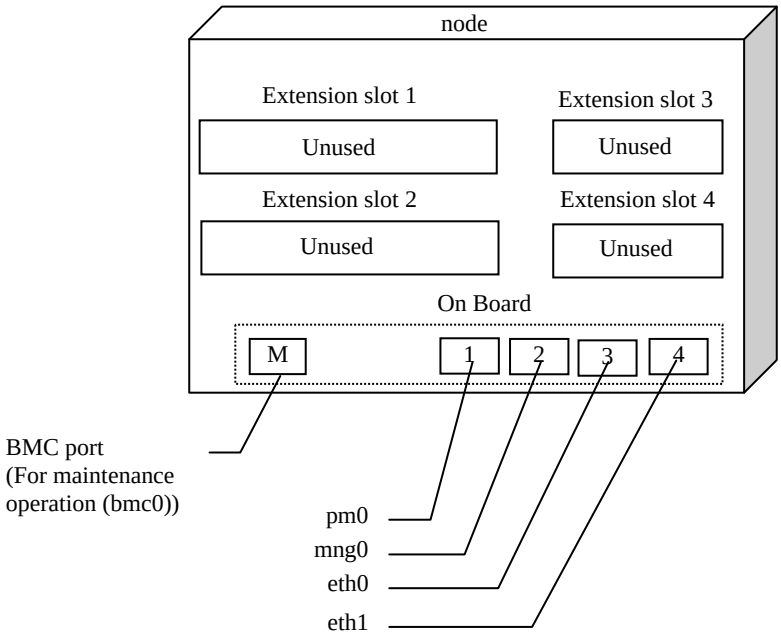

Figure A.2.2.2-2 Rear View of the Node

Table A.2.2.2-2 Confirmation table for the port allocation of node

#	Position	Port position	Interface name	Application	Remarks
1	On-board	1	pm0	Private Maintenance port	—
2		2	mng0	Management port	It is also used for the connection to Front-end LAN.
3		3	eth0	data port	It becomes unused port when the management port connects to Front-end LAN.
4		4	eth1	data port	
5		BMC	bmc0	BMC	—

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A.2.3 LAN Cable

A.2.3.1 In the Case of Cluster Configuration shows the LAN cable connection when it is cluster configuration, and 'A.2.3.2 In the case of single node configuration' shows when it is single node configuration.

A.2.3.1 In the case of cluster configuration

Note that No. 9 port of the management LAN IP-SW is unoccupied port because it is alternative port for No.1 or No.3 port of the Management LAN IP-SW in case when problem occurs.

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(1) Connecting the management system network
Figure A.2.3.1-1 shows the connection diagram for the management system network.

Connect the management port (mng) of node0 to port 1 on the management LAN IP-SW, and connect the BMC of node0 to port 2 on the management LAN IP-SW.
Connect the management port (mng) of node1 to port 3 on the management LAN IP-SW, and connect the BMC of node1 to port 4 on the management LAN IP-SW.
Connect the management server to port 7 on the management LAN IP-SW.

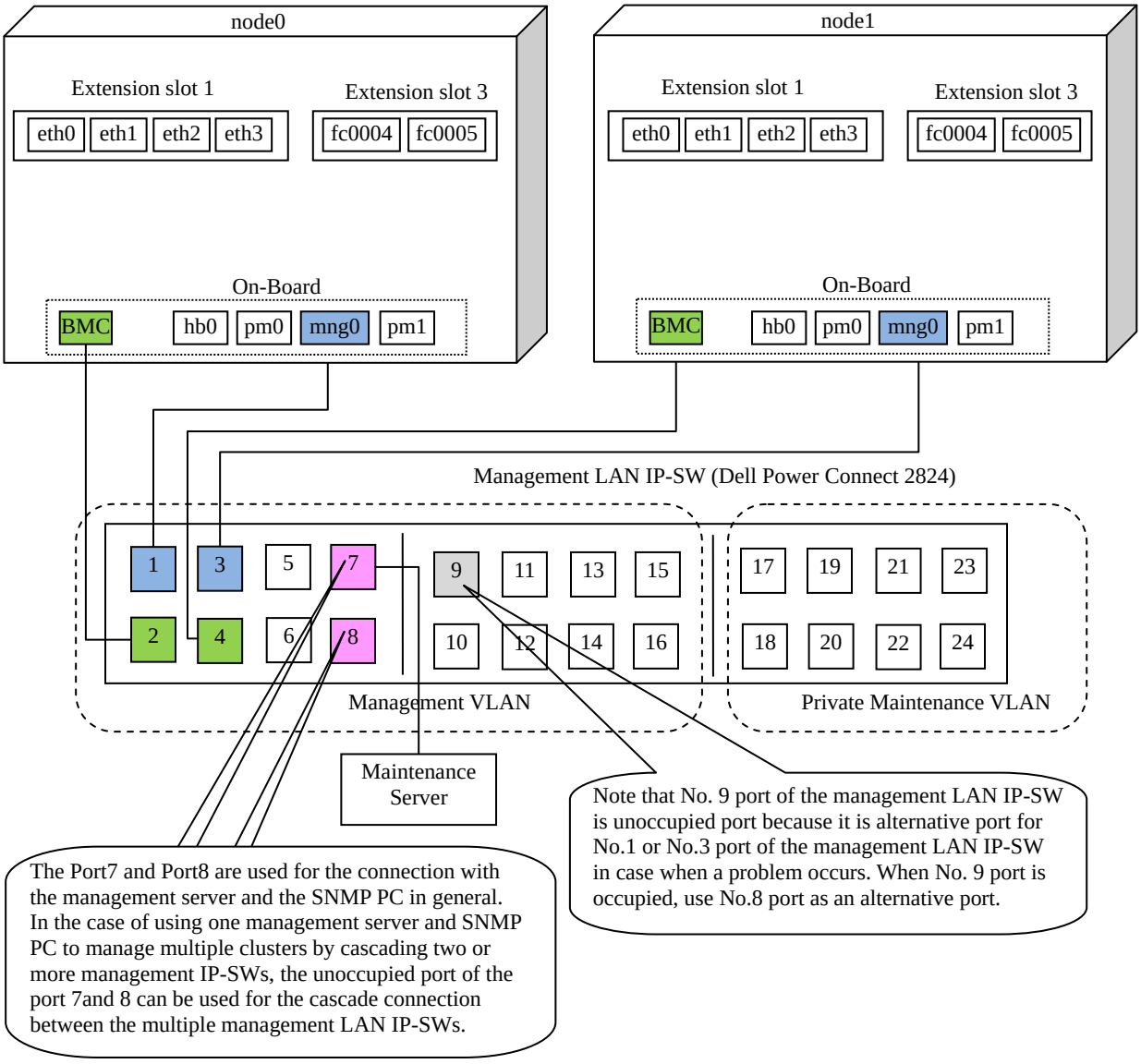

Figure A.2.3.1-1 Connection Diagram for the Management System Network

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(2) Connecting the private maintenance ports
Figure A.2.3.1-2 shows the connection diagram for the private maintenance ports.

Connect the private maintenance port (pm) of node0 to port 17 on the management LAN IP-SW.
Connect the private maintenance port (pm) of node1 to port 18 on the management LAN IP-SW.
When you use a maintenance PC, connect it to a free port from ports 19 to 22 on management LAN IP-SW.

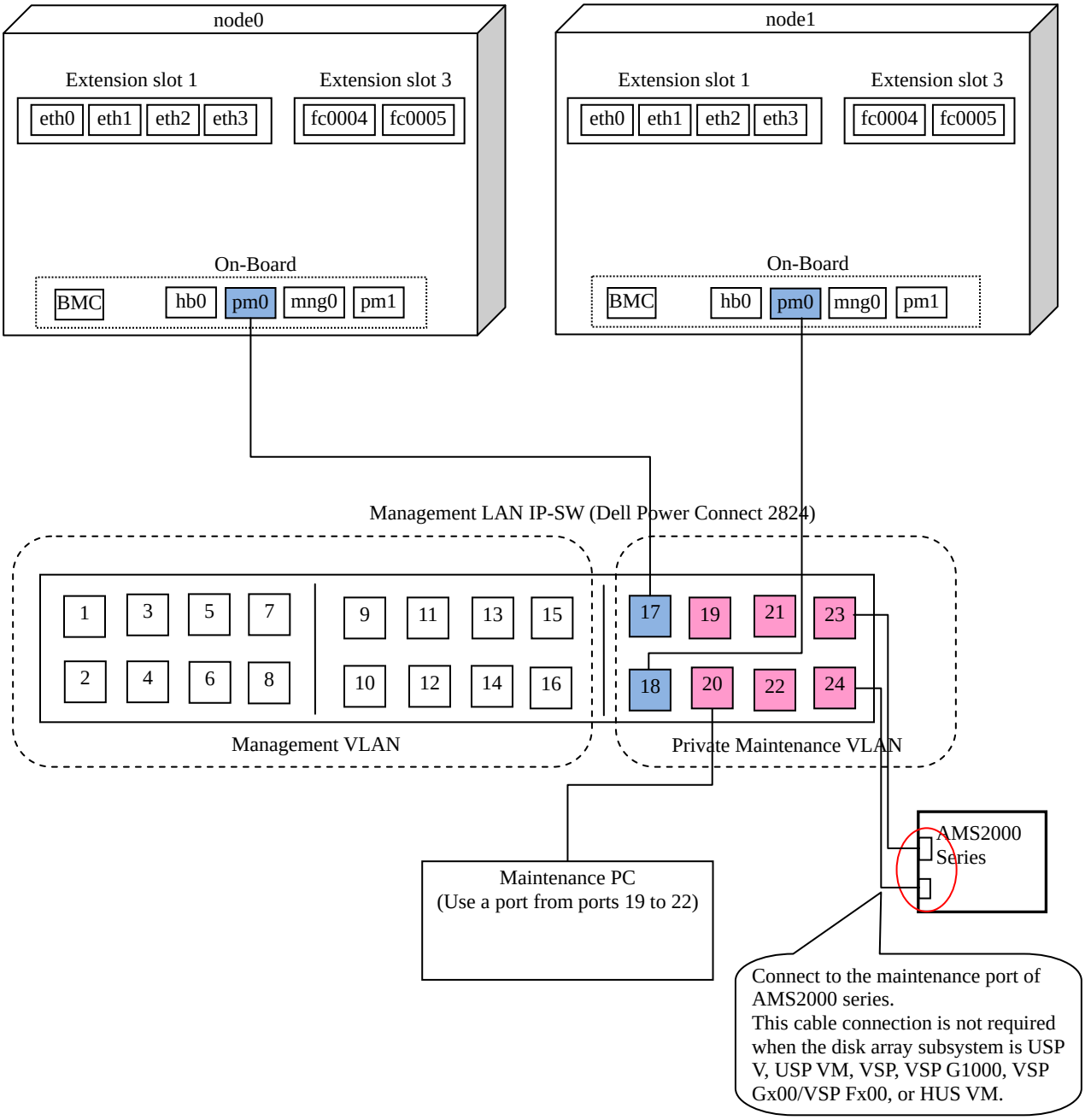

Figure A.2.3.1-2 Private Maintenance Port Connection Diagram

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(3) Connecting the heartbeat ports
Figure A.2.3.1-3 shows the heartbeat port connection diagram.

Connect the heartbeat ports (hb) of nodes 0 and 1.
For the LAN cable to connect the heartbeat port, the 5E or more categories is required.

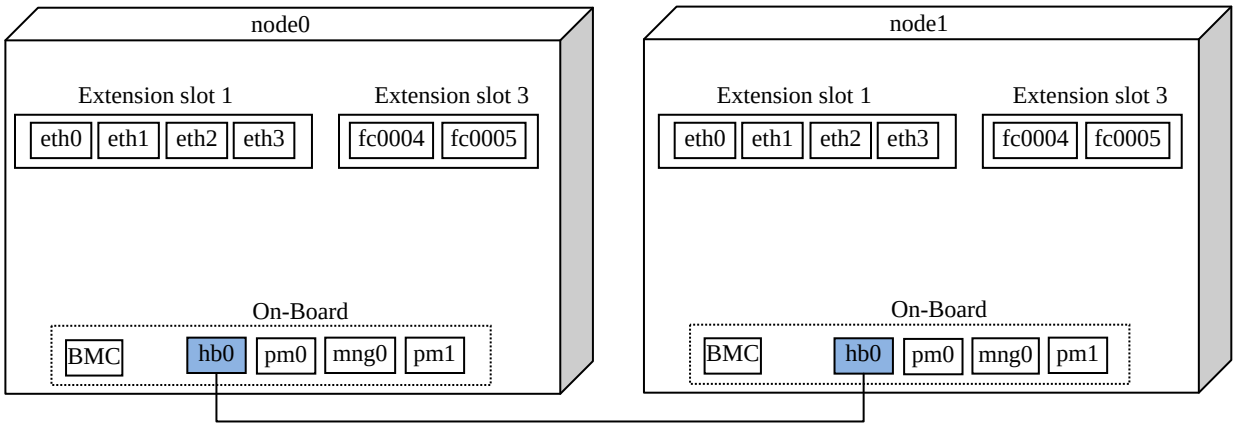

Figure A.2.3.1-3 Heartbeat Port Connection Diagram

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(4) Connecting the management LAN IP-SW and the disk array subsystem
Figure A.2.3.1-4 shows the connection diagram for the management LAN IP-SW and the disk array subsystem.

Disk array subsystems are connected to the management LAN only for the AMS2000 series or HUS100 series. They are not necessary to be connected to the management LAN for USP V, USP VM, VSP, VSP G1000, VSP Gx00/VSP Fx00, or HUS VM. If disk array subsystems are connected, connect them to #5 or #6.

Connect ports 5 and 6 on the management LAN IP-SW to the user management port (LAN1) on the disk array subsystem (first unit).
For connecting one more disk array subsystem, connect the disk array subsystem to the ports 11 and 12 of the management LAN IP-SW. When connecting third unit of disk array subsystem, apply cascade connection by connecting the disk array subsystem to the port 13 and 14 or add an IP-SW or connect the disk array subsystem to the port 15 and 16 if the port 15 and 16 on the management VLAN are unoccupied.

NOTE: When using the customer's management LAN IP-SW, request the customer to connect the connections of #5 to #6 of Management VLAN ports shown in the Figure A.2.3.1-4 to the 2 of 6 ports provided by the customer.

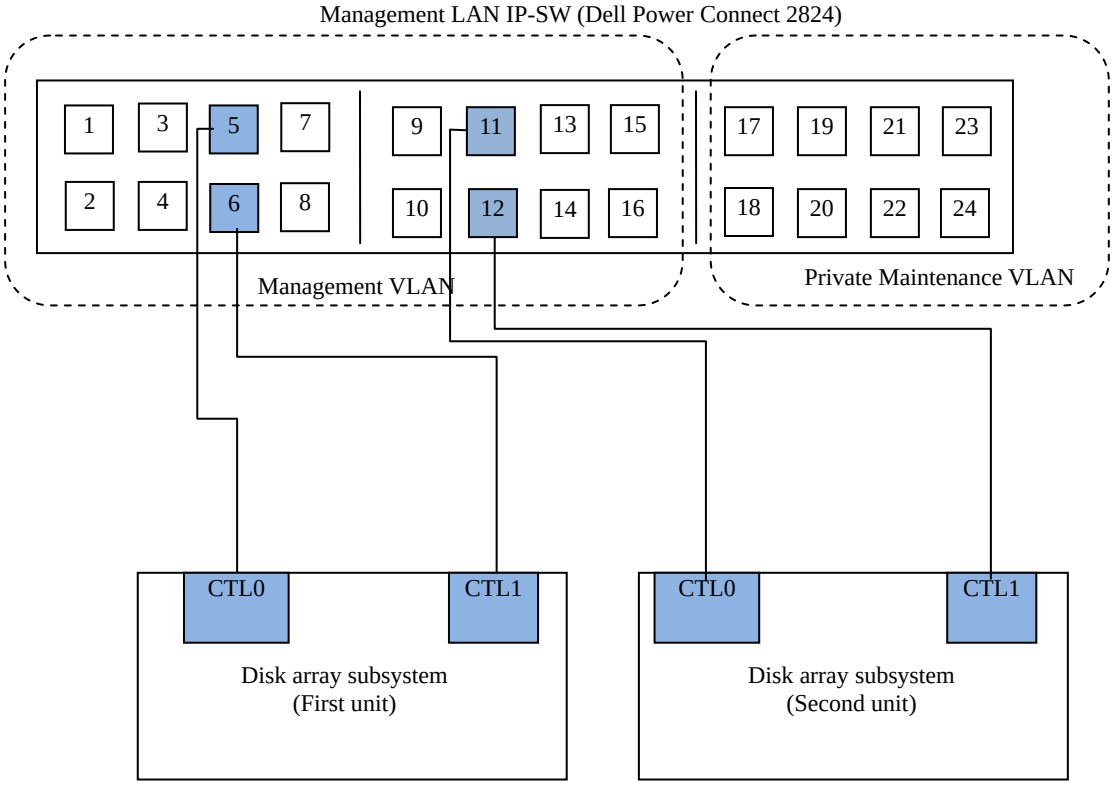

Figure A.2.3.1-4 Connection Diagram for the Management LAN IP-SW and the Disk Array Subsystem

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(5) Connecting the front-end LAN
Figure A.2.3.1-5 shows the front-end LAN connection diagram.

Connect port 10 on the management LAN IP-SW to the router.
Connect the router to the front-end LAN.
Router is connected only when the system environment is the configuration of HDI for HCP, and a customer makes a contract of Hi-Track with HDS.

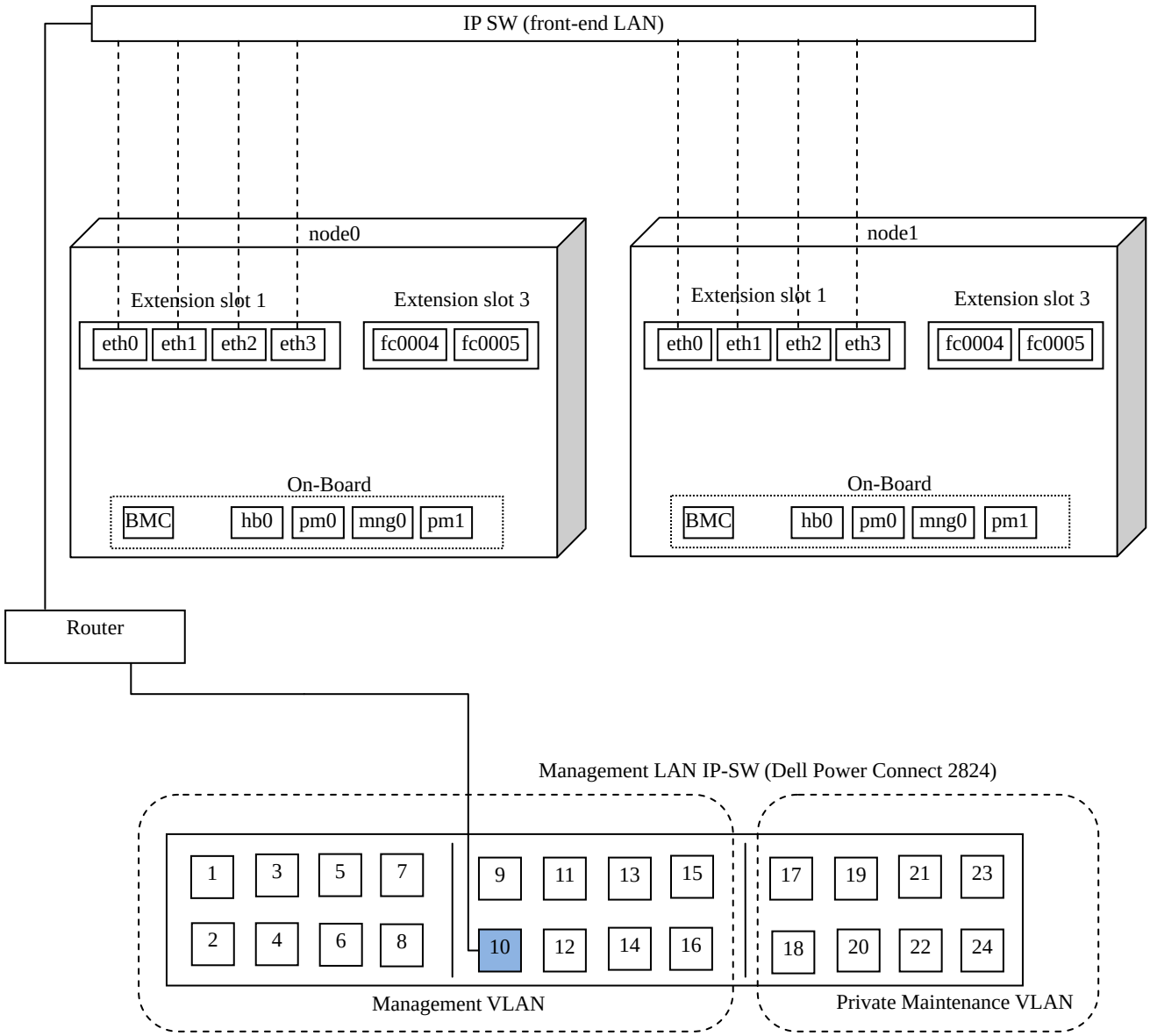

Figure A.2.3.1-5 Front-end LAN Connection Diagram

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(6) Connecting the HiTrack PC
Figure A.2.3.1-6 shows the HiTrack PC connection diagram. (Either HiTrack or SNMP is required.)

Connect the HiTrack PC to port 9 on the management LAN IP-SW.
When you use SNMP, connect it to port 8 on the management LAN IP-SW.

HiTrack monitors HDI via the management LAN.
It also monitors the HCP node via the connection with the front-end LAN described in (5).

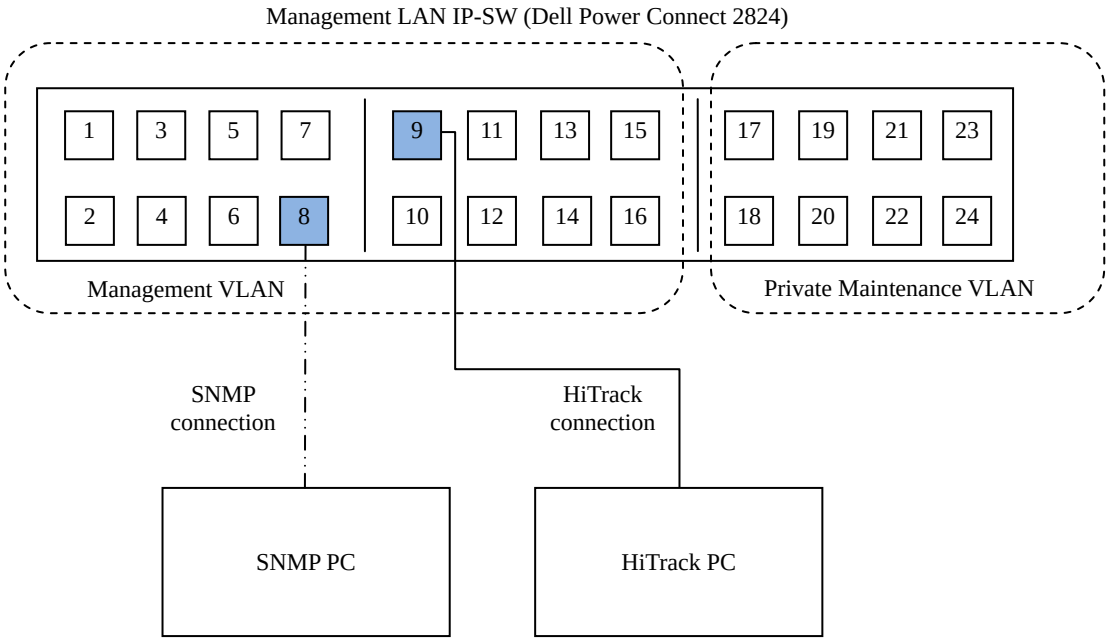

Figure A.2.3.1-6 HiTrack PC Connection Diagram

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A.2.3.2 In the case of single node configuration

(1) Connecting the front-end LAN
Figure A.2.3.2-1 shows a case of front-end LAN connection by using the two LAN cable, and Figure A.2.3.2-2 shows a case of front-end LAN by using the one LAN cable.

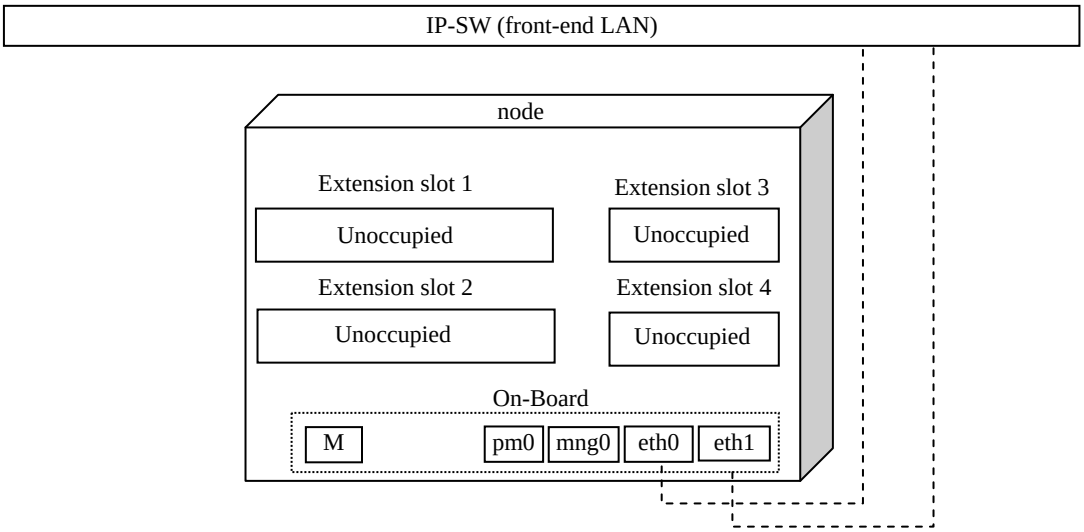

Figure A.2.3.2-1 Front-end LAN Connection by using two LAN cables (Configuration using trunk 2 Data ports)

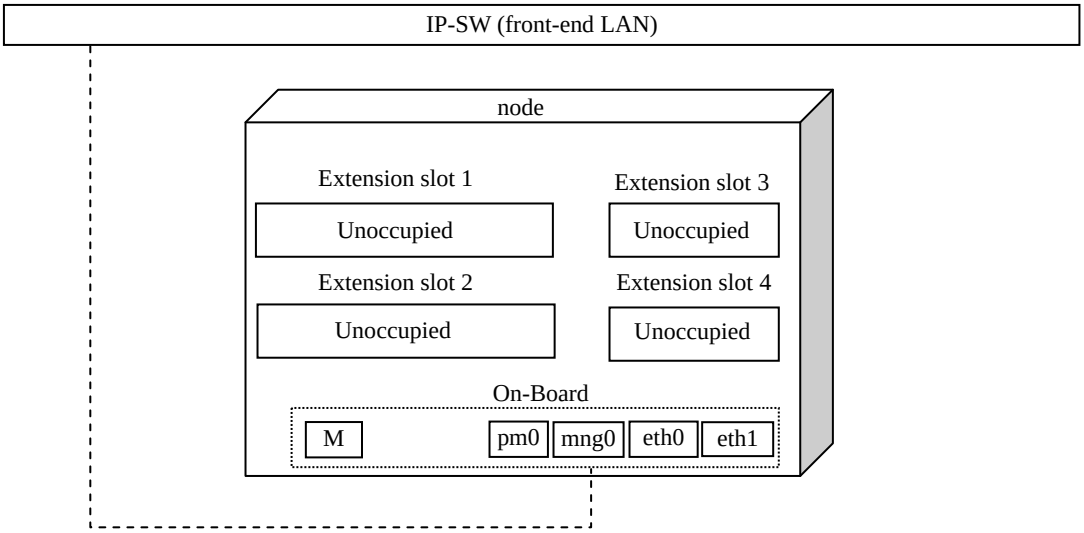

Figure A.2.3.2-2 Front-end LAN Connection by using one LAN cable (Configuration using Management port)

(2) Connecting the private maintenance ports

Private Maintenance port should be connected directly with a maintenance PC.

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A.2.4 Notes on Port when Maintenance Mode is Used

NOTE: The notes described in this section apply only for the single node configuration.

(1) When starting the maintenance mode
Normally, the maintenance PC is connected to the location as shown in Figure A.2.4-1 when executing the maintenance operation. However, when executing the maintenance operation by starting up the maintenance mode in the single node configuration, the network port (including pm0) is changed as shown in Figure A.2.4-2. Therefore please note that the location to be connected the maintenance PC changes. And in the case of the configuration using Management port, remove the LAN cable on the side of mng0 that is connected between the IP-SW configured by the customer and the mng0 of the node at the time of starting the maintenance mode, and connect the LAN cable of the maintenance mode to the location shown in the Figure A.2.4-2.

(2) When terminating the maintenance mode
In the case of the configuration using Management port, reconnect the LAN cables between the IP-SW configured by the customer and the node as shown in Figure A.2.4-1.

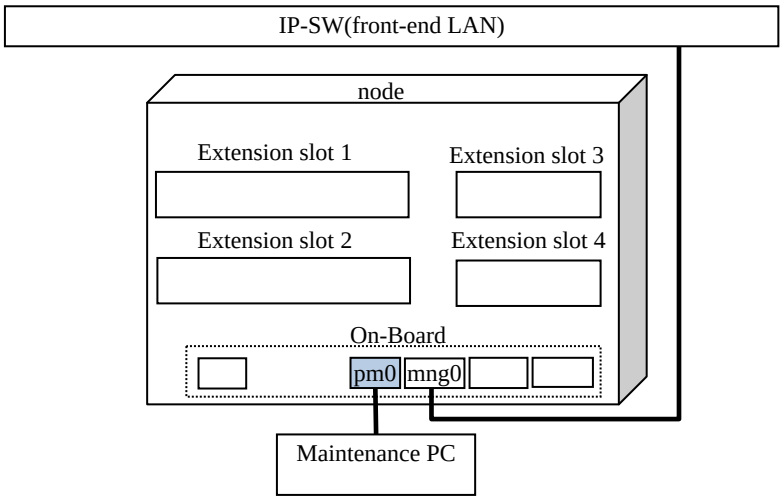

Figure A.2.4-1 Location of the Maintenance PC to be connected when executing the maintenance operation during the OS running.

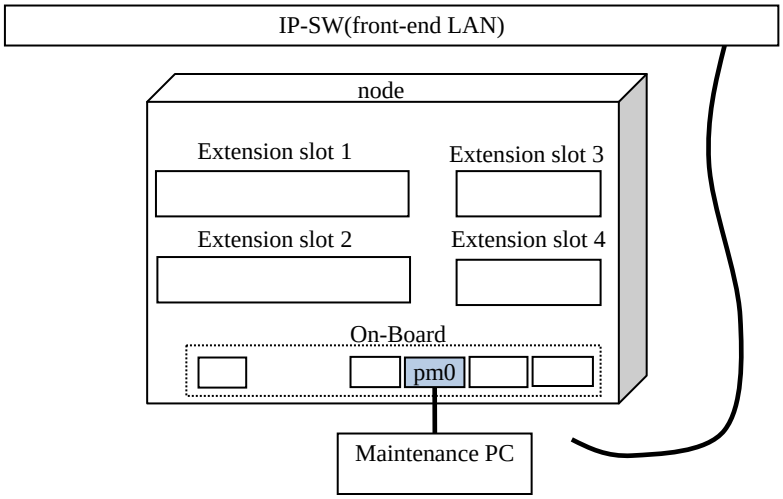

Figure A.2.4-2 Location of the Maintenance PC to be connected when using the maintenance mode

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A.4.2 Example of Installing the Node in the Basic Configuration (single node)

A.4.3 Example of Installing the Node in the Configuration of HDI for HCP (cluster node)

A.4.4 Example of Installing the Node in the Configuration of HDI for HCP (single node)

A.4.5 Example of Installing the Node in the Configuration of HDI for Cloud (cluster node)

A.4.6 Example of Installing the Node in the Configuration of HDI for Cloud (single node)

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A.4 Installing the Nodes

A.4.1 Example of Installing the Node in the Basic Configuration (cluster node)

This is unsupported configuration in this mode.

A.4.2 Example of Installing the Node in the Basic Configuration (single node)

This is unsupported configuration in this model.

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A.4.3 Example of Installing the Node in the Configuration of HDI for HCP (cluster node)

CAUTION

To prevent a rack frame fall, install the heavier devices on the lower positions as much as possible. The devices must be installed in the order of a position from the bottom. Please make sure when you install nodes on your rack frame.

The following figure shows an example of installing the nodes of Hitachi Data Ingestor on a rack on which the Hitachi Content Platform has been installed.
Installing Hitachi Data Ingestor requires a 6U rack space. Figure A.4.3-1 shows an example of installing the basic chassis of AMS2000 series, and three extension chassis mounted from the bottom of the rack frame. In this case, totally 13U rack spaces are required with the basic chassis and three extension chassis.
When connecting with USP V, USP VM, or VSP, the disk array subsystem will not be installed on a rack frame of which the node is installed.

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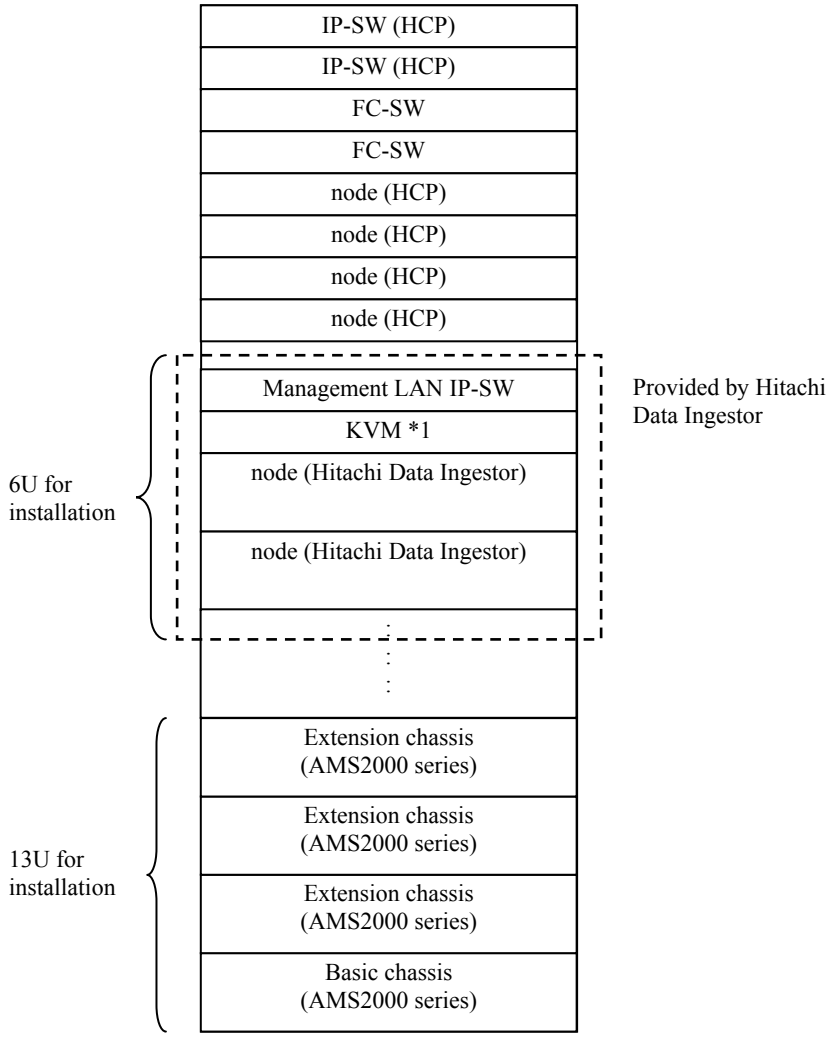

Figure A.4.3-1 Example of Installing the node in the Configuration of HDI for HCP

*1: KVM might not exist in the case of USP V, USP VM, or VSP connection. When there is no KVM, a monitor and a keyboard must be borrowed by the system administrator at the time of maintenance.

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A.4.4 Example of Installing the Node in the Configuration of HDI for HCP (single node)

⚠ CAUTION

To prevent a rack frame fall, install the heavier devices on the lower positions as much as possible. The devices must be installed in the order of a position from the bottom. Please make sure when you install nodes on your rack frame.

The following figure shows an example of installing the nodes of Hitachi Data Ingestor on a rack on which the Hitachi Content Platform has been installed.
There are no Management LAN IP-SW, Array Storage, and KVM in HDI single node configuration, so HDI needs only 2U for one Dell/PowerEdge R710.
Figure A.4.4-1 shows an example of installing the basic chassis and 3 extended chassis of AMS2000 series, in the order of a position from the bottom.

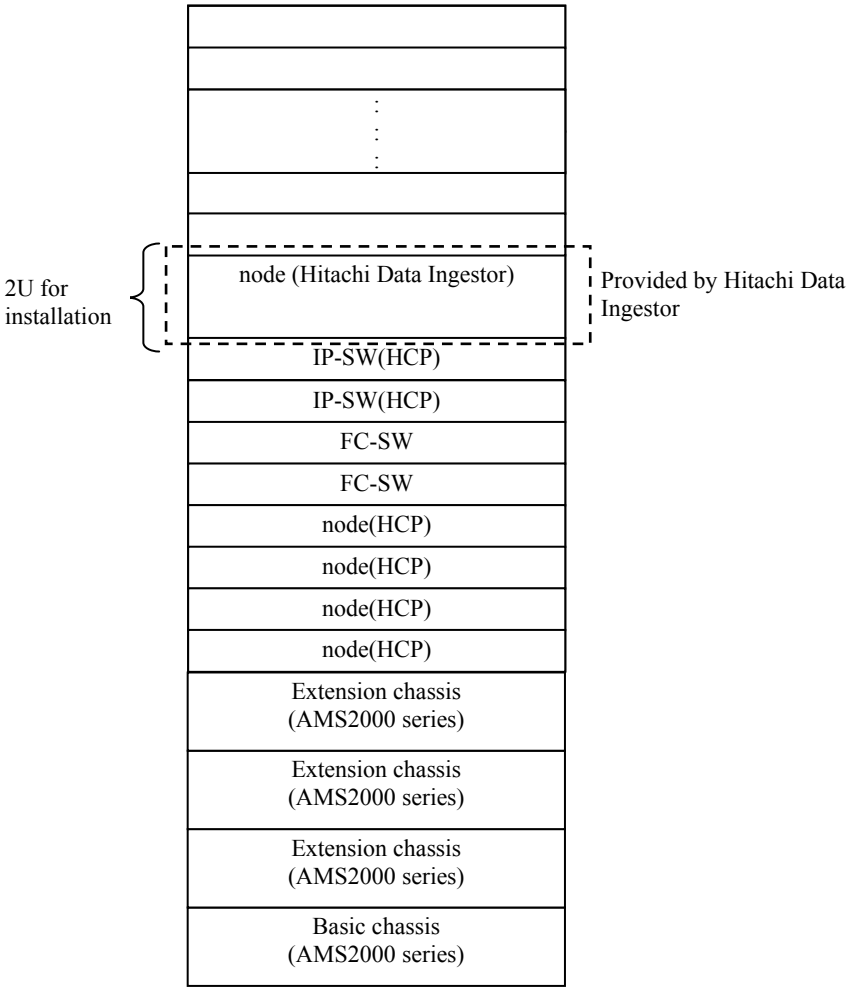

Figure A.4.4-1 Example of Installing the node in the Configuration of HDI for HCP (single node)

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A.4.5 Example of Installing the Node in the Configuration of HDI for Cloud (cluster node)

CAUTION

To prevent a rack frame fall, install the heavier devices on the lower positions as much as possible. The devices must be installed in the order of a position from the bottom. Please make sure when you install nodes on your rack frame.

Figure A.4.5-1 shows an example of installing the nodes of HDI for Cloud configuration (cluster node).

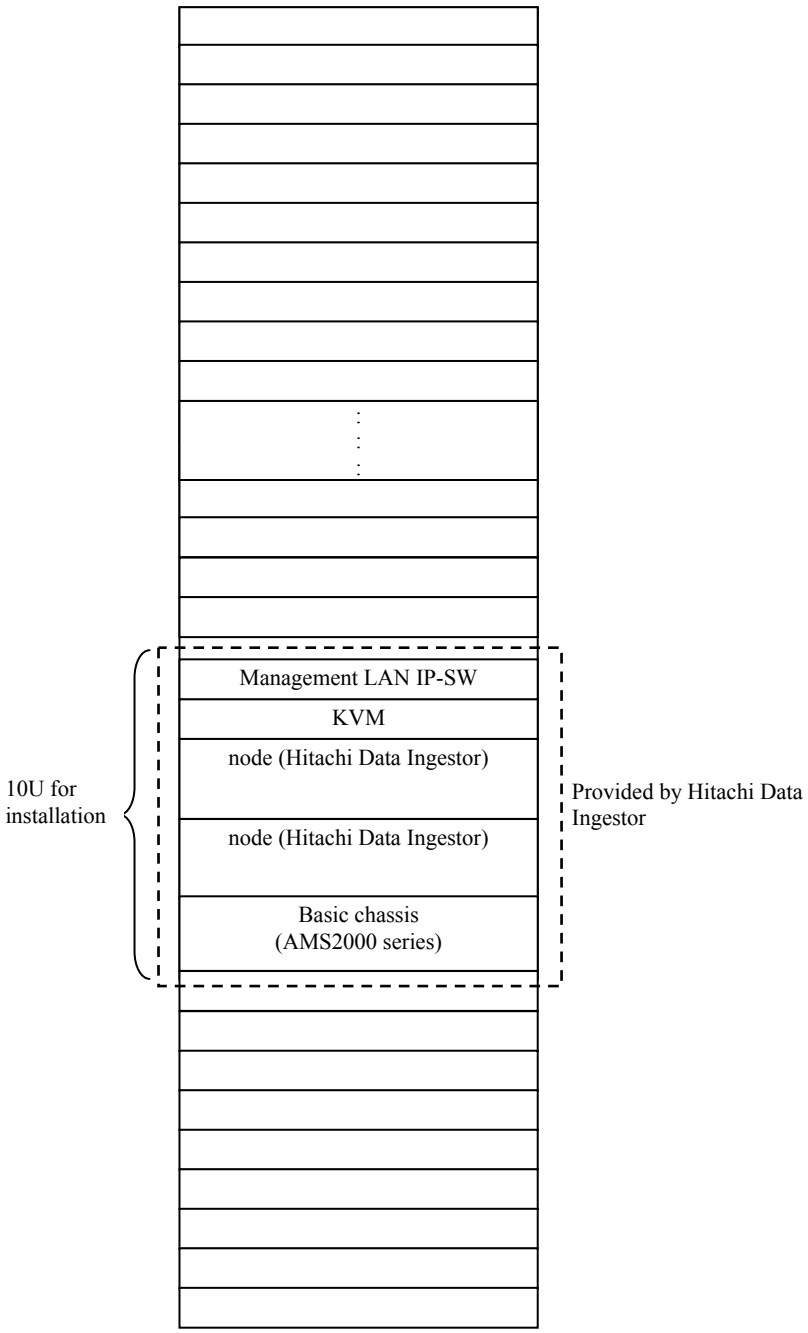

Figure A.4.5-1 Example of Installing the node in the Configuration of HDI for Cloud (cluster node)

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A.4.6 Example of Installing the Node in the Configuration of HDI for Cloud (single node)

CAUTION

To prevent a rack frame fall, install the heavier devices on the lower positions as much as possible. The devices must be installed in the order of a position from the bottom. Please make sure when you install nodes on your rack frame.

Install only a node in the configuration of HDI for Cloud (single node) because any of disk array subsystem, maintenance LAN, IP-SW, KVM is not used for this configuration.

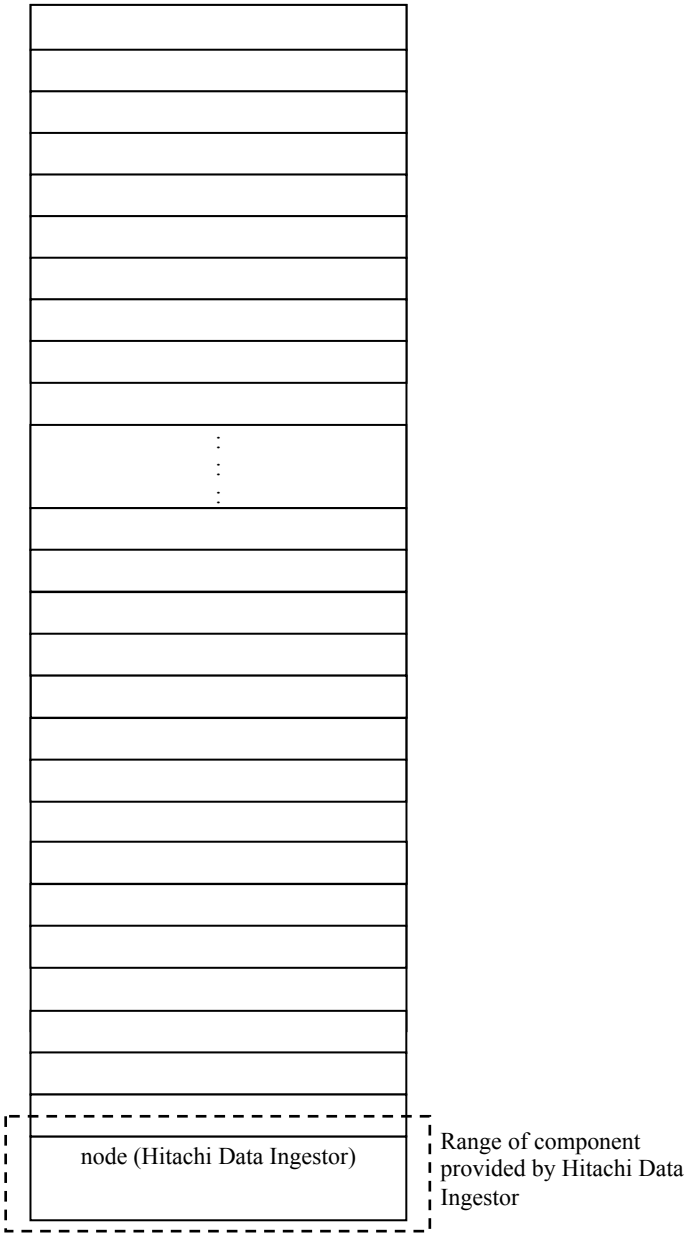

Figure A.4.6-1 Example of installing the node of the configuration of HDI for Cloud (single node)

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B.1 Connection and Confirmation of OS Console

B.1.1 Confirmation of KVM Connection

B.1.2 Startup Confirmation of the OS by Using KVM

B.1.3 Connection Confirmation of the Remote Console

B.1.4 Startup Confirmation of the OS by Using Remote Console

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B.1 Connection and Confirmation of OS Console

There are two ways to connect a OS console: one is connecting with KVM and the other is connecting by the remote console.

KVM is an input/output device with the hardware display monitor and it can execute command operation for the node. KVM is usually available to connect to multiple nodes, and it is used by switching the nodes. KVM is used in the cluster node configuration.

Remote console is a function that can execute command operation for the node on the maintenance PC window. Remote console is used in the single node configuration.

B.1.1 Confirmation of KVM Connection

Before executing the setup operation in the cluster configuration, the console must be available to use.

Check that the following connections are performed.

(1) Make sure that the power cable of the KVM is connected and the power switch is ON.
(2) Make sure that the KVM and the console are connected by the cable.
(3) Make sure that the power cable of the console is connected.
(4) Make sure that the KVM and the node are connected by the cable.

Refer to “Installation Instructions” in the leaflet provided by the hardware vendor for the details.

*: Figure B.1.1-1 is for reference only. The shape of the cable and the cable insertion position may be changed by a hardware enhancement.

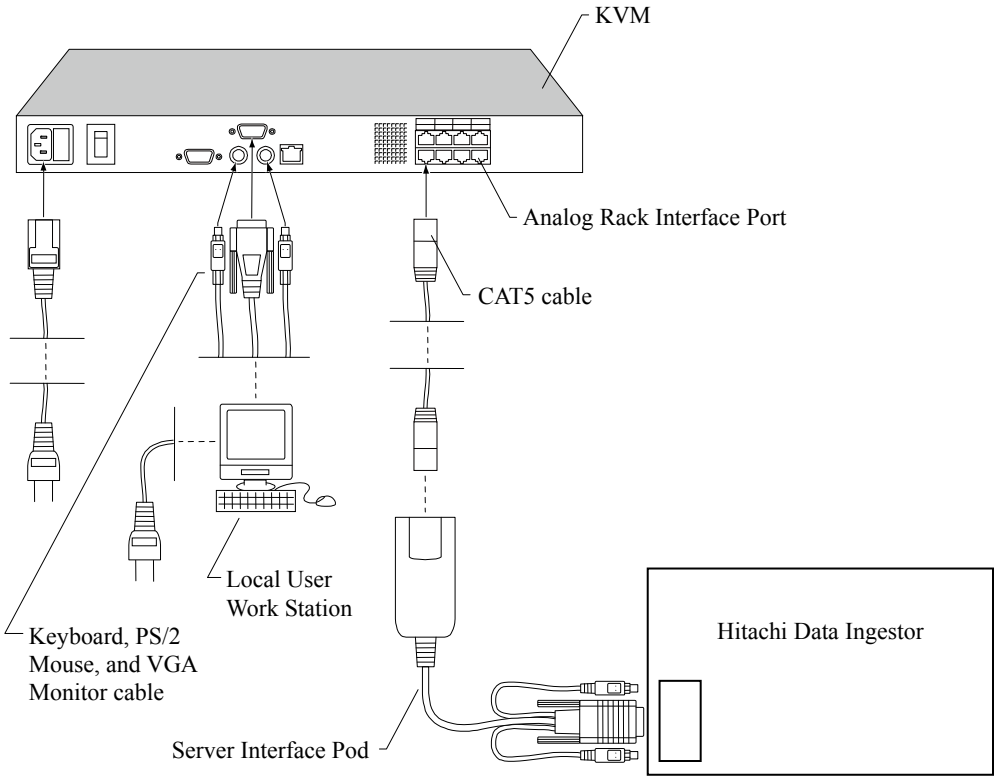

Figure B.1.1-1 KVM Connection

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B.1.2 Startup Confirmation of the OS by Using KVM

Whether the OS has been started or not can be checked by using the KVM console window, when the OS is installed already in the cluster configuration.

This procedure is described in the following.

(1) Change the display of console window to the side of node that you want to confirm the OS startup.

(2) Make sure that the same prompt is displayed in the bottom of the login prompt window as shown in Figure B.1.2-1.
Displaying the same prompt means that the OS is running.

```
Hitachi File Storage Linux


xxxxxxxx(Service tag ID) login:
```

Figure B.1.2-1 Login Prompt window

The following display might be displayed without displaying the login prompt window.

(a) While collecting dump
Dump collecting window as shown in Figure B.1.2-2 is displayed.
Wait the completion of dump collection.
The time that you takes for dump collection depends on the size of the memory of the node. Table B.1.2-1 show the rough guide for collecting dump file.
Refer the collecting time of the dump file by referring the table B1.2-1, and check if the login prompt of Figure B1.2-1 is displayed after the guide time .

Table B.1.2-1 Dump File Collection Time as a Guide

#	the size of the memory	dump file collection time as a guide
1	6GB	3 to 5 minutes
2	12GB	6 to 10 minutes

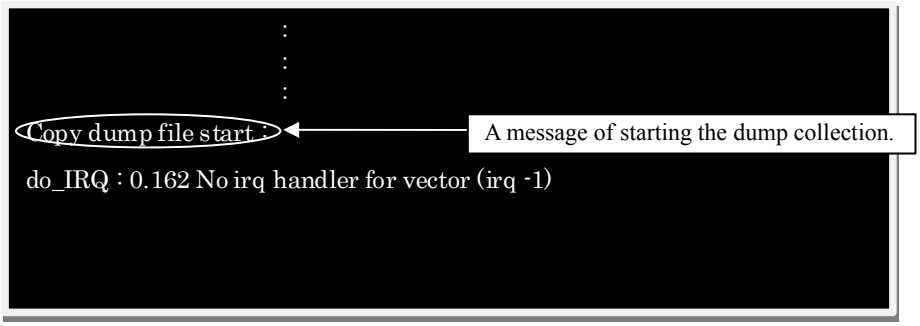

Figure B.1.2-2 Dump Collecting window

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(b) When it is in the booting
There are the following cases while booting.

(i) When the booting window or progress of the boot process is displayed one after another
Make sure that the login prompt window is displayed in 4 minutes later.
For the information about login prompt window, refer to 'Figure B.1.2-1 Login Prompt window'.

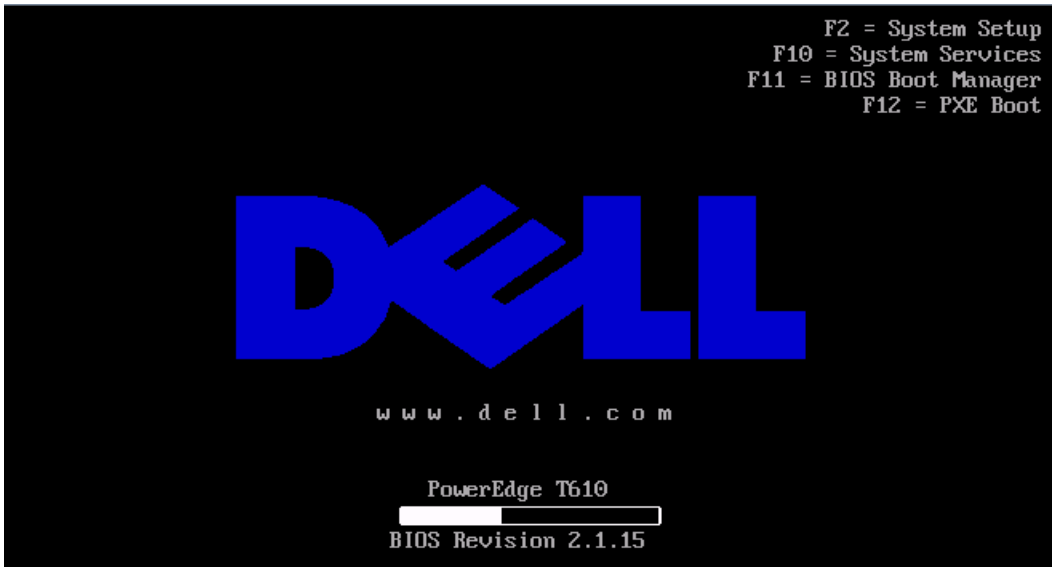

Figure B.1.2-3 The Booting window

(ii) When the boot processing is stopped
It indicates that the OS is not running.

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(c) When OS boot failure window is displayed
It indicates that the OS is not running.

```
PXE-E51 : No DHCP or proxyDHCP offers were received.
PXE-M0F:Exiting Broadcom PXE ROM.

No boot device available.
Current boot mode is set to BIOS.

Please ensure compatible bootable media is available.
Use the system setup program to change the boot mode as needed.

Strike F1 to retry boot,F2 for system setup,F11 For BIOS boot manager.
```

Figure B.1.2-4 OS Boot Failure window 1

```
iDRAC6 Configuration Utility 1.54
Copyright 2010 Dell Inc. All Rights Reserved

iDRAC6 Firmware Revision version: 1.50.24
Primary Backplane Firmware Revision 1.09


-------------------------------
      IPv6 Settings
-------------------------------
 IPv6 Stack      : Disabled
 Address 1       : ::
 Default Gateway : ::
 -------------------------------
      IPv4 Settings
 -------------------------------
 IPv4 Stack      : Enabled
 IP Address      :  10.213. 76.187
 Subnet mask     : 255.255.254. 0
 Default Gateway :  10.213. 76. 3
Press <Ctrl-E> for Remote Access Setup within 5 sec......

 Strike the F1 key to continue, F2 to run the system setup program
```

Figure B.1.2-5 OS Boot Failure window 2

(d) When there is no window display
Wait about 4 minutes.

(i) OS has just started booting.
Make sure that the login prompt window is displayed in 4 minutes later.
For the information about login prompt window, refer to 'Figure B.1.2-1 Login Prompt window'.

(ii) When no changes after 4 minutes.
It indicates that the OS hangs up.

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B.1.3 Connection Confirmation of the Remote Console

Before executing the setup operation in the single node configuration, the console must be available to use.

Check that the following connections are performed.

(1) Make sure that the power cable of the maintenance PC is connected.

(2) Make sure that the network segment for the BMC port and the network segment for the maintenance PC is the same.
Check the IP address of the BMC port by LCD.
For the method to confirm with the LCD, refer to the following manual provided by the hardware vendor.

"Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual"

If the network segment between the BMC port and the Maintenance PC is different, change the setting of maintenance PC to be the same network segment.
The following is the assumed IP address of the BMC port.

- The IP address is 192.168.0.120 at the initial OS installation.
- After the OS installation, it becomes the same network segment with one of the private maintenance port that is specified at the installation, and the host part is fixed as 40.

  Example: When the IP address of the maintenance port is 10.0.0.51, the IP address of the BMC port becomes 10.0.0.40.

(3) Make sure that the LAN port of the maintenance PC and the BMC port of the node is connected with a LAN cable (cross cable).

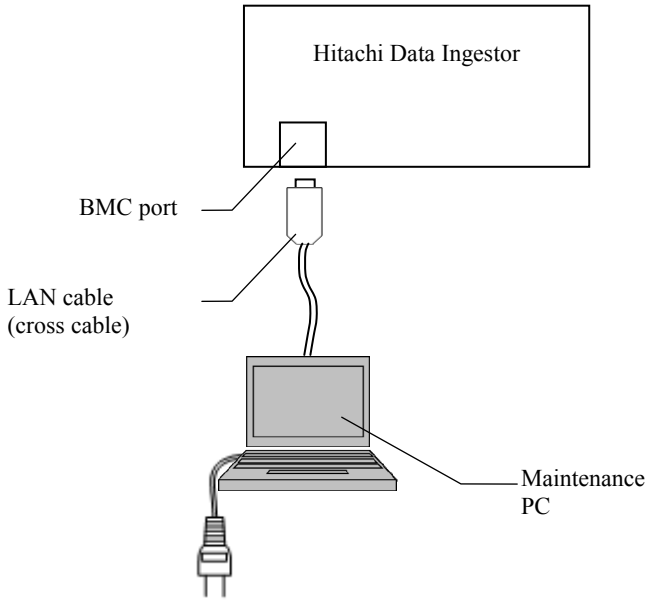

Figure B.1.3-1 Connection Example of Remote Console

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B.1.4 Startup Confirmation of the OS by Using Remote Console

Whether the OS has been started or not can be checked by using remote console window, when the OS is installed already in the single node configuration.

This procedure assumed that the connection confirmation by the remote console has been completed at 'B.1.3 Connection Confirmation of the Remote Console'.

The procedure is described in the following.

(1) Startup the Internet Explorer from the maintenance PC.
Click [Start] > [Program] > [Internet Explorer].

(2) Input the following address in the address bar on the Internet Explorer.
"https://<IP address of the BMC>"

Input the IP address of the BMC, which is confirmed at 'B.1.3 Connection Confirmation of the Remote Console'.

(3) Make sure that the BMC login window is displayed.

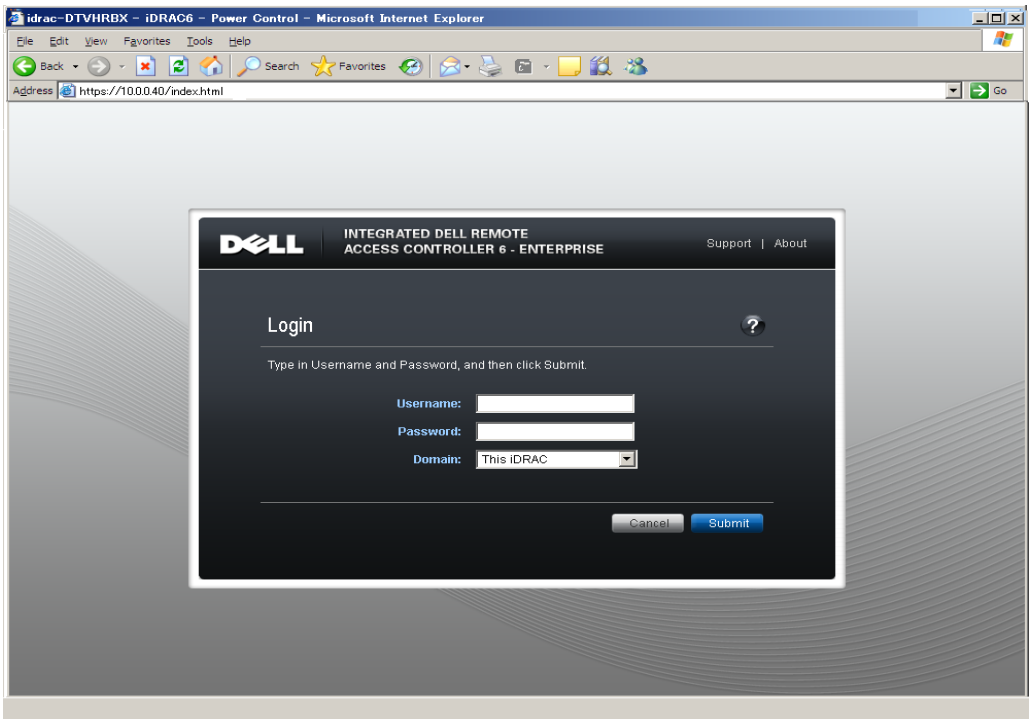

Figure B.1.4-1 BMC Login Window 1

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(4) Enter “root” in the [Username], and “calvin” in the [Password].
Select “This iDRAC” from [Domain].
After the input, click [Submit] button.

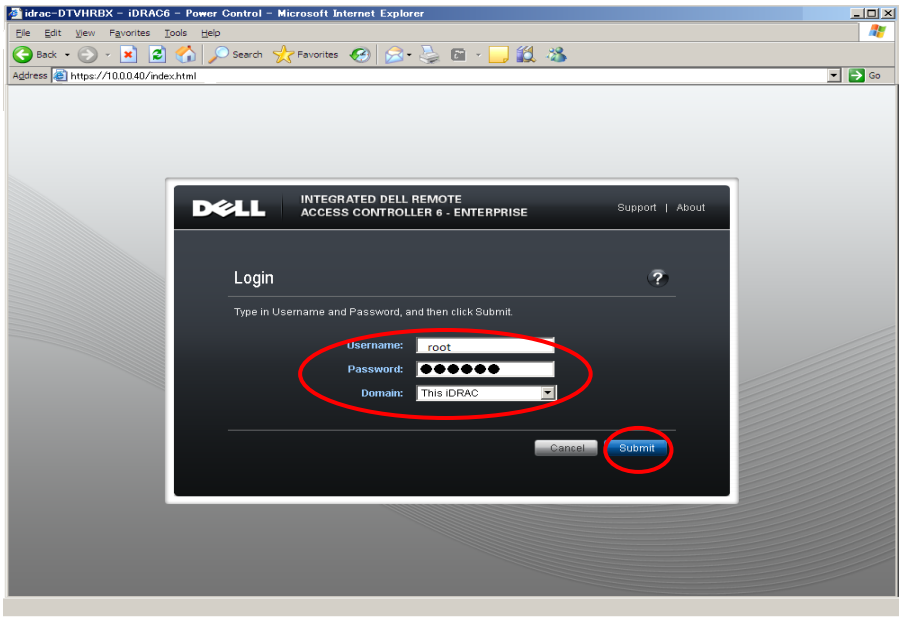

Figure B.1.4-2 BMC Login window 2

(5) Figure B.1.4-3 System Summary window is displayed.
Click [Console/Media].

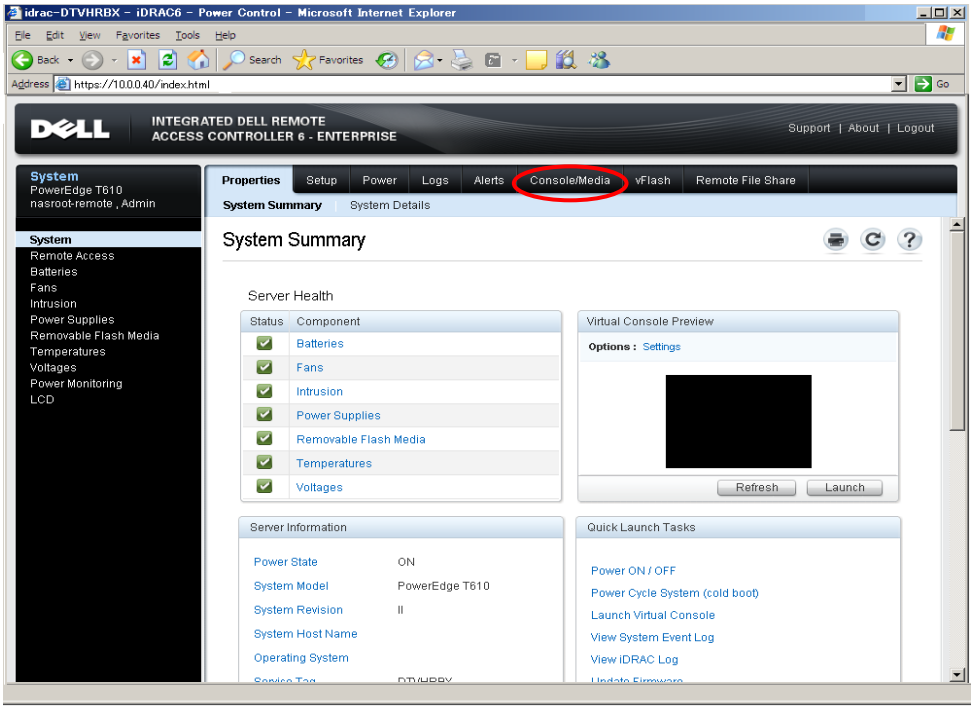

Figure B.1.4-3 System Summary window

Copyright © 2011, Hitachi, Ltd.

(6) Figure B.1.4-4 Virtual Console and Virtual Media window is displayed.
Click [Launch Virtual Console] button.

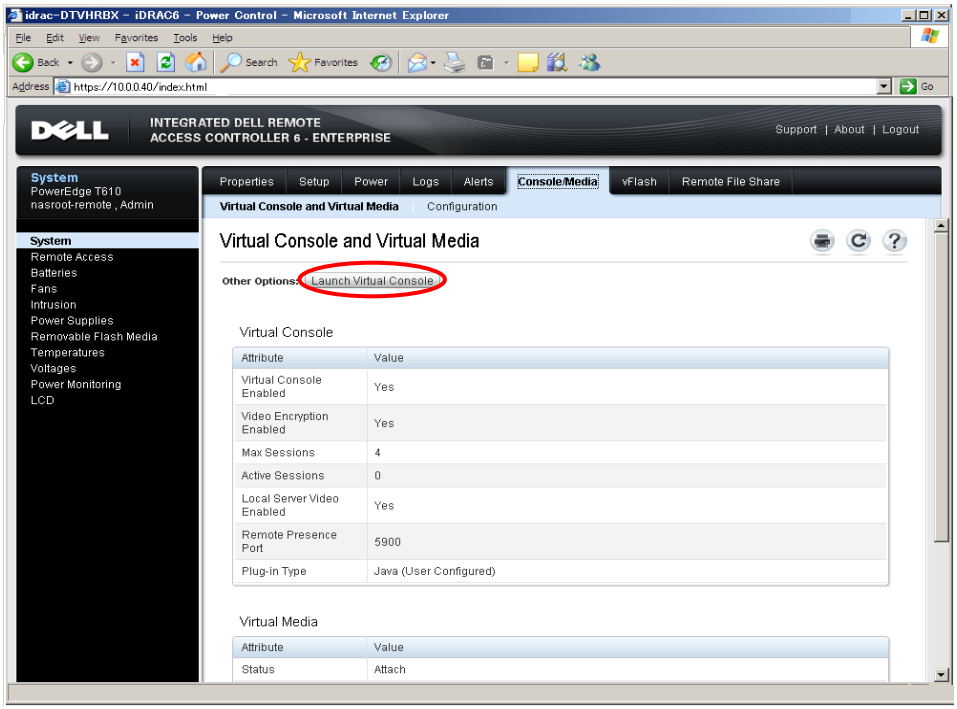

Figure B.1.4-4 Virtual Console and Virtual Media window

(7) Make sure that the same prompt is displayed in the bottom of the login prompt window as shown in Figure B.1.4-5. Displaying the same prompt means that the OS is running.

```
Hitachi File Storage Linux

xxxxxxxx(Service tag ID) login:
```

Figure B.1.4-5 Logon Prompt window

The following display might be displayed without displaying login prompt window.

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(a) While collecting dump
Dump collecting window as shown in Figure B.1.4-6 is displayed.
Wait the completion of dump collection. The time that you takes for dump collection depends on the size of the memory of the node. Table B.1.4-1 show the rough guide for collecting dump file.
Refer the collecting time of the dump file by referring the table B.1.4-1, and check if the login prompt of Figure B.1.4-5 is displayed after the guide time .

Table B.1.4-1 Dump File Collection Time as a Guide

#	the size of the memory	dump file collection time as a guide
1	12GB	10 to 12 minutes

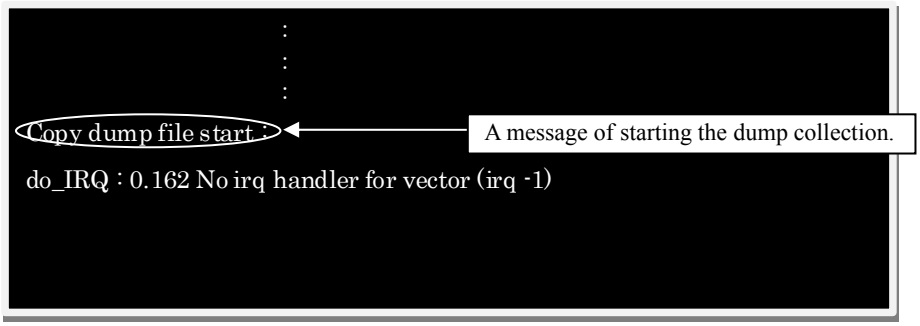

Figure B.1.4-6 Dump Collecting window

(b) When it is in the booting
There are the following cases while booting.

(i) When the booting window or progress of the boot process is displayed one after another
Make sure that the login prompt window is displayed in 4 minutes later.
For the information about login prompt, refer to ‘Figure B.1.4-5 Login Prompt window’.

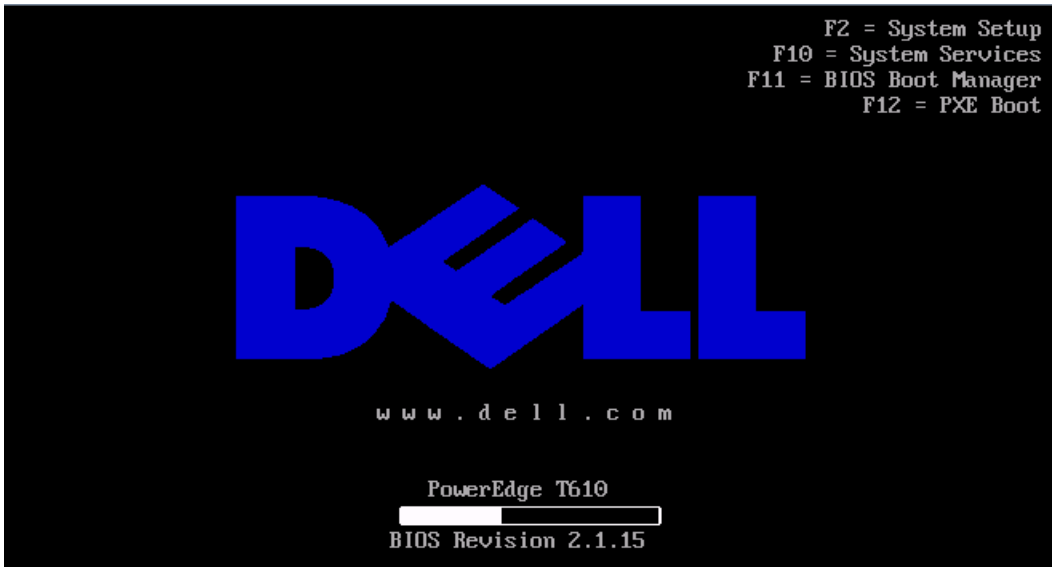

Figure B.1.4-7 The Booting window

(ii) When the boot processing is stopped
It indicates that the OS is not running.

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(c) When OS boot failure window is displayed
It indicates that the OS is not running.

```
PXE-E51 : No DHCP or proxyDHCP offers were received.
PXE-M0F:Exiting Broadcom PXE ROM.

No boot device available.
Current boot mode is set to BIOS.

Please ensure compatible bootable media is available.
Use the system setup program to change the boot mode as needed.

Strike F1 to retry boot,F2 for system setup,F11 For BIOS boot manager.
```

Figure B.1.4-8 OS Boot Failure window 1

```
iDRAC6 Configuration Utility 1.54
Copyright 2010 Dell Inc. All Rights Reserved

iDRAC6 Firmware Revision version: 1.50.24
Primary Backplane Firmware Revision 1.09


-------------------------------
      IPv6 Settings
-------------------------------
 IPv6 Stack      : Disabled
 Address 1       : ::
 Default Gateway : ::
 -------------------------------
      IPv4 Settings
 -------------------------------
 IPv4 Stack      : Enabled
 IP Address      :  10.213. 76.187
 Subnet mask     : 255.255.254. 0
 Default Gateway :  10.213. 76. 3
Press <Ctrl-E> for Remote Access Setup within 5 sec......

 Strike the F1 key to continue, F2 to run the system setup program
```

Figure B.1.4-9 OS Boot Failure window 2

(d) When there is no window display
Wait about 4 minutes.

(i) OS has just started booting.
Make sure that the login prompt window is displayed in 4 minutes later.
For the information about login prompt, refer to 'Figure B.1.4-5 Login Prompt window'.

(ii) When no changes after 4 minutes.
It indicates that the OS hangs up.

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B.2 BIOS Setting

B.2.1 BIOS Version Checking Procedure

NOTE:
- Obtain the BIOS Update CD before executing the BIOS update procedures.
- Do not terminate or reboot the node while the BIOS update is in process. In addition, do not remove the BIOS Update CD.
- The same procedure can be used for the downgrading.
- In the cluster configuration, when requesting the system administrator for failback, failover and starting or stopping the cluster of a node, check the cluster status of the node with referring to "Maintenance Tool '2.2 Displaying the Cluster Status (clstatus)' (MNTT 02-0040)" before the request.
  After completing of the operation by the system administrator, confirm the cluster status of the node with "Maintenance Tool '2.2 Displaying the Cluster Status (clstatus)' (MNTT 02-0040)", and execute the OS termination of the node. However, when the system administrator is absent, the maintenance personnel should contact to system administrator and get the permission from him/her to execute the above operation. For the execution procedure, refer to "Maintenance Tool '3.1 Failover and Node Termination to Execute the OS stop or the OS reboot' (MNTT 03-0000)".
- In the single node configuration, the service is stopped while executing the procedure because it includes the procedure to stop the node. Ask the system administrator if the service can be stopped or not, and then execute the procedures.
- Before executing BIOS update procedure, it is needed to verify that the console window is available to use.

  [In the cluster configuration]
  Open the KVM console window, and then execute the procedure (1).
  For the connection of KVM, refer to 'B.1.1 Confirmation of KVM Connection'.
  [In the single node configuration]
  Open the remote console window, and then execute the procedure (1).
  For the connection of remote console, refer to 'B.1.3 Connection Confirmation of the Remote Console'.

(1) Refer to "Maintenance Tool '2.2 Displaying the Cluster Status (clstatus)' (MNTT 02-0040)", and check whether the resource groups are running on the node where the BIOS version is to be confirmed.
When the resource groups are running, request the system administrator to failover the resource groups to the other node and to change the "Node Status" to "INACTIVE".
For the reference place in User's Guide describing the details about stopping a node, refer to "General 'Reference Place in User's Guide for Operating Procedures Table 4 'Stopping and starting a node'' (GENE 00-0040)", and for the reference place in User's Guide describing the details about failover/failback of a resource group, refer to "General 'Reference Place in User's Guide for Operating Procedures Table 4 'Changing the execution node of a resource group'' (GENE 00-0040)".
However, when the system administrator is absent, the maintenance personnel should contact to system administrator and get the permission from him/her to execute the above operation. For the execution procedure, refer to "Maintenance Tool '3.1 Failover and Node Termination to Execute the OS stop or the OS reboot' (MNTT 03-0000)".
In the single node configuration, this procedure is not needed, so perform the next procedure.

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(2) Reboot the OS of the node with referring to "Maintenance Tool '2.29 Rebooting the OS of This Side Node (nasreboot)' (MNTT 02-1790)".

(3) If "F2 = System Setup" is displayed on the upper right of the console window while the OS of the node is starting, press [F2] key.

(4) The BIOS setup utility window is displayed as shown in Figure B.2.1-1.
Check whether the version displayed in [BIOS Version] needs to be updated by referring to the Version management table (Web.)
If the firmware update is necessary, select [Boot Setting] and press [Enter] key to proceed to step (5.)
If the firmware update is not necessary, return to the caller and execute the rest of the operations.

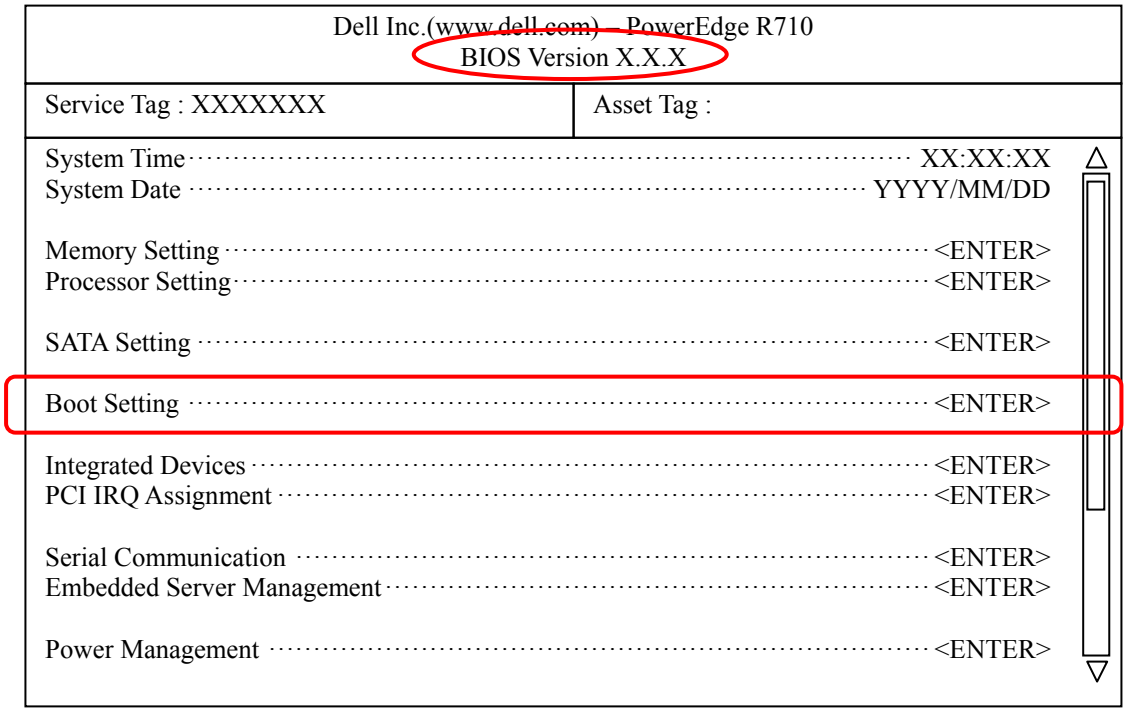

Figure B.2.1-1 BIOS Setup Utility window

NOTE: For the detailed operation method of BIOS setup utility used in step (4) to step (11), refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" provided by the hardware vendor.

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(5) The boot settings window is displayed as shown in Figure B.2.1-2.
Select “Boot Sequence”, and press [Enter] key.

```
Boot Mode ····· BIOS
Boot Sequence ····· <ENTER>
Boot Sequence Retry ····· Disable
```

Figure B.2.1-2 Boot Settings window

(6) The boot sequence window is displayed as shown in Figure B.2.1-3.
Check that the displayed items are arrayed as shown in Figure B.2.1-3.
If the display order differs, sort them by using the [+] key and the [-] key.
In addition, if a [√] mark does not appear at the left end of the displayed item, the device is invalid. In this case, add a [√] mark by pressing [Space] key.

NOTE: When entering characters in the BIOS Setup Utility window, the keyboard layout is recognized as the 101 keyboard (QWERTY based layout).

```
√ 1.SATA Optical drive
√ 2.Hard drive C:(Integrated RAID PERC 6/5 Integrate)
√ 3.Embedded NIC IMBA v5.0.5 Slot 0100
```

Figure B.2.1-3 Boot Sequence window

(7) Press [Esc] key in the boot sequence window as shown in Figure B.2.1-3.
It returns to the boot settings window as shown in Figure B.2.1-2.

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(8) Press [Esc] key in the boot settings window as shown in Figure B.2.1-2.
It returns to the BIOS setup utility window as shown in Figure B.2.1-4.

```
Dell Inc.(www.dell.com) – PowerEdge R710
BIOS Version X.X.X

Service Tag : XXXXXXX          Asset Tag :

System Time ..................................... XX:XX:XX
System Date ..................................... YYYY/MM/DD

Memory Setting .................................. <ENTER>
Processor Setting ............................... <ENTER>

SATA Setting .................................... <ENTER>

Boot Setting .................................... <ENTER>

Integrated Devices .............................. <ENTER>
PCI IRQ Assignment .............................. <ENTER>

Serial Communication ............................ <ENTER>
Embedded Server Management ...................... <ENTER>

Power Management ................................ <ENTER>
```

Figure B.2.1-4 BIOS Setup Utility window

(9) Insert the BIOS update CD into the DVD ROM drive of the node.

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(10) Press [Esc] key in the BIOS setup utility window as shown in Figure B.2.1-4.
The BIOS setup utility termination confirmation window is displayed as shown in Figure B.2.1-5.

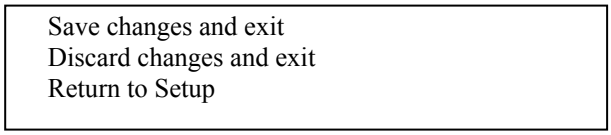

Figure B.2.1-5 BIOS Setup Utility Termination Confirmation Window

(11) The procedure differs whether the setting was changed in step (6) or not.
(a) If the setting was changed in step (6), select "Save changes and exit" and press [Enter] key.

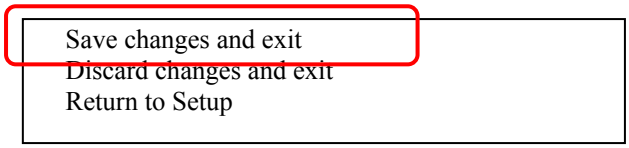

Figure B.2.1-6 BIOS Setup Utility Termination Confirmation Window (a)

(b) If the setting was not changed in step (6), select "Discard changes and exit" and press [Enter] key.

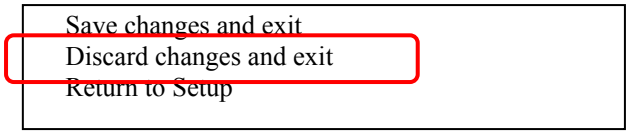

Figure B.2.1-7 BIOS Setup Utility Termination Confirmation Window (b)

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(12) When the CD boot is completed, Figure B.2.1-8 BIOS Update Prompt window is displayed.
Press any key when “Press any key to continue” is displayed.

```
Flash BIOS Update Program-Version x.x.x

Verifying system configuration
Checking ROM file...
ROM file CRC-32 is correct
Press any key to continue
```

Figure B.2.1-8 BIOS Update Prompt window 1

(13) Enter [Y] when “Press ‘Y’ to replace “x.x.x” BIOS with “x.x.x” BIOS” is displayed.

```
Flash BIOS Update Program-Version x.x.x

Verifying system configuration
Checking ROM file...
ROM file CRC-32 is correct
Press any key to continue

About to replace – BIOS
Press ‘Y’ to replace “x.x.x” BIOS with “x.x.x” BIOS
```

Figure B.2.1-9 BIOS Update Prompt window 2

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(14) When the same BIOS version is updated, “Press ‘C’ to continue anyway” is displayed. Enter ‘C’.
When a different BIOS version is updated, proceed to step (15).

```
Flash BIOS Update Program-Version x.x.x

Verifying system configuration
Checking ROM file...
ROM file CRC-32 is correct
Press any key to continue

About to replace – BIOS
Press ‘Y’ to replace “x.x.x” BIOS with “x.x.x” BIOS

Flash contents already the same
Upgrade will have no effect
Press ‘C’ to continue anyway
```

Figure B.2.1-10 BIOS Update Prompt window 3

(15) The BIOS update processing is started.
Wait until the progress status indication reaches 100%.

```
Flash BIOS Update Program-Version x.x.x

Verifying system configuration
Checking ROM file...
ROM file CRC-32 is correct
Press any key to continue

About to replace – BIOS
Press ‘Y’ to replace “x.x.x” BIOS with “x.x.x” BIOS

Erasing Flash.............100%
Programming Flash..........100%
Comparing Flash...........100%

Done!--Press any key to reboot
Note : System will power off for a few seconds and then restart
```

Figure B.2.1-11 BIOS Update Prompt window 4

(16) “Done!--Press any key to reboot” is displayed. Remove the BIOS Update CD and press any key to reboot the of the node.
Return to the caller of the BIOS update procedures and execute the rest of the operations.

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B.2.2 BMC Firmware Version Checking Procedure

Execute the BMC firmware update via Web interface in the maintenance PC during the node termination.

Change the IP address of the maintenance PC to the IP address belonging to the same network segment as the IP address of BMC.

Check the IP address of the BMC port by LCD.
For the method to confirm with the LCD, refer to the following manual provided by the hardware vendor.

[When the node is Dell/PowerEdge R710]
"Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual".

Connect the LAN cable of the maintenance PC directly to the BMC port that executes the update operation.
The overview of the procedure is described below.

NOTE:
- For the detailed operation method of iDRAC6, refer to "Integrated Dell™ Remote Access Controller 6 (iDRAC6) User Guide" provided by the hardware vendor.
- When security warning is displayed in the Internet Explorer window, check the contents and click [OK] button.
- Before executing the update procedure of the BMC firmware, acquire CDROM in which the BMC firmware file to be updated is stored in advance.
- The same procedure can be used for the downgrading.

(1) Store the BMC firmware to update in the maintenance PC.

(2) Start Internet Explorer in the maintenance PC.
Click [Start] - [Program] - [Internet Explorer].

(3) Enter the following address in the address bar of Internet Explorer.
"https://<IP address of BMC to update>"

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(4) Check that the BMC Login window is displayed.

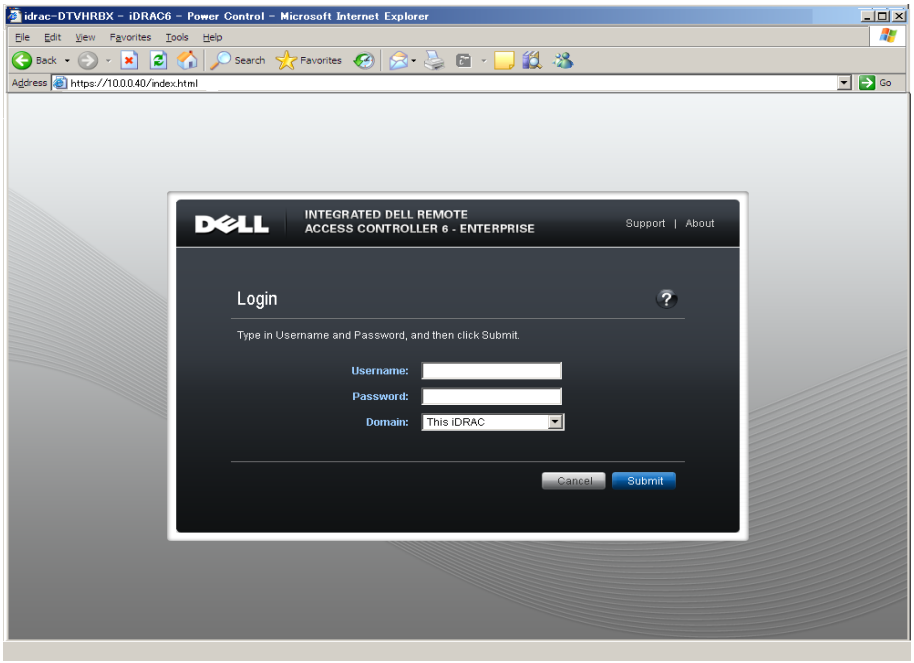

Figure B.2.2-1 BMC Login window 1

(5) Enter “root” in [Username] and “calvin” in [Password].
Select “This iDRAC” for “Domain”.
After entering them, press [Submit] button.

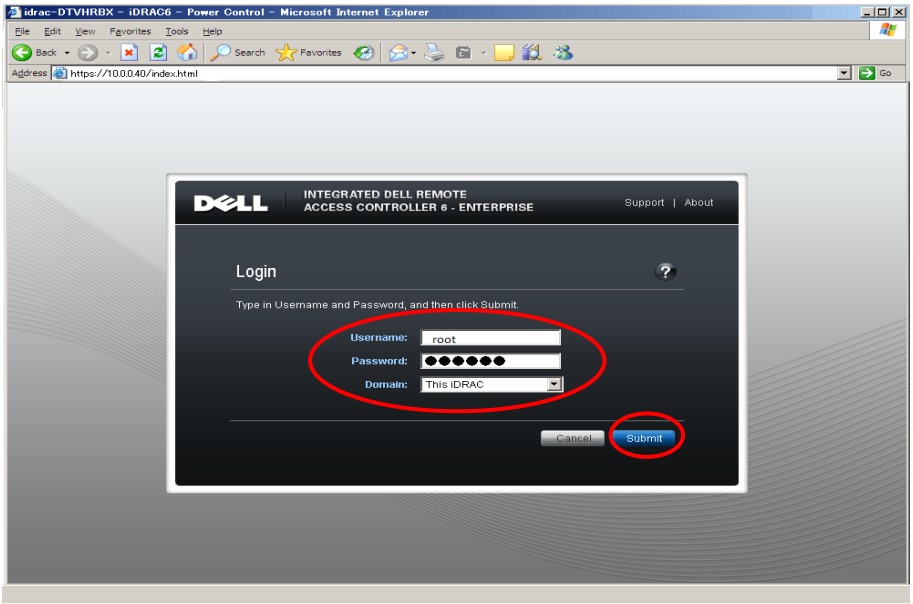

Figure B.2.2-2 BMC Login Window 2

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(6) The System Summary Window is displayed as shown in Figure B.2.2-3.
Click [Remote Access].

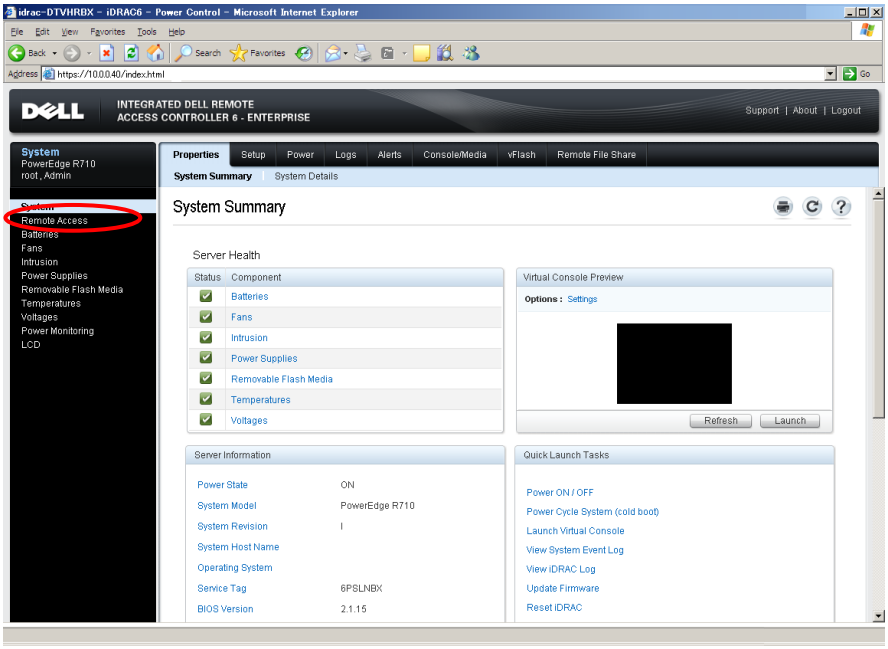

Figure B.2.2-3 System Summary window

(7) The iDRAC Information Window is displayed as shown in Figure B.2.2-4.
Check whether the version displayed in [Firmware Version] needs to be updated by referring to the Version management table (Web.)
If the firmware update is necessary, click [Update] tab to proceed to step (8.)
If the firmware update is not necessary, return to the caller and execute the rest of the operations.

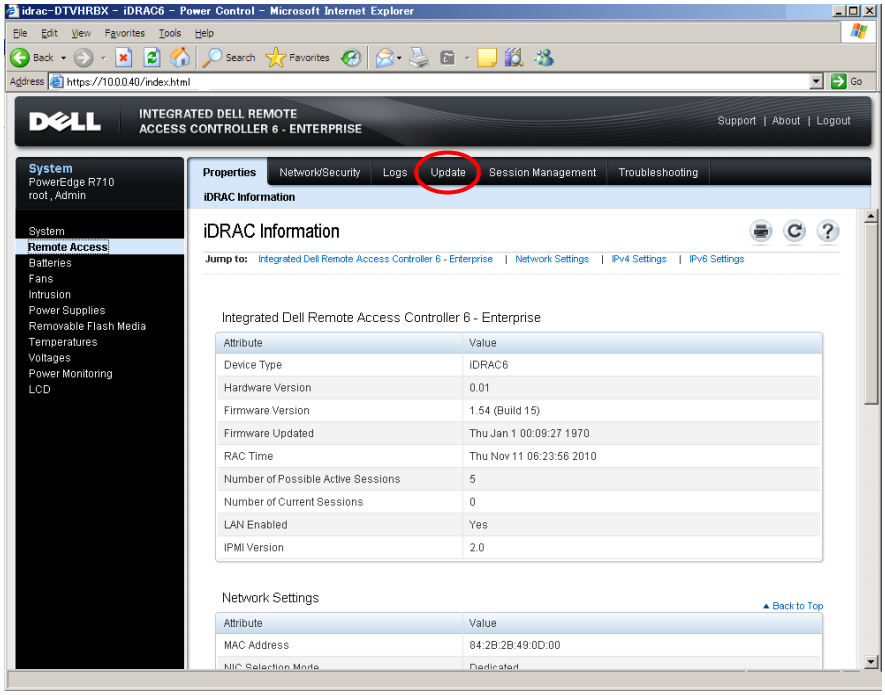

Figure B.2.2-4 iDRAC Information window

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(8) The Firmware Update window 1 is displayed as shown in Figure B.2.2-5.
Click [Browse] button, and select the target firmware image file to be updated that is stored in the step (1).

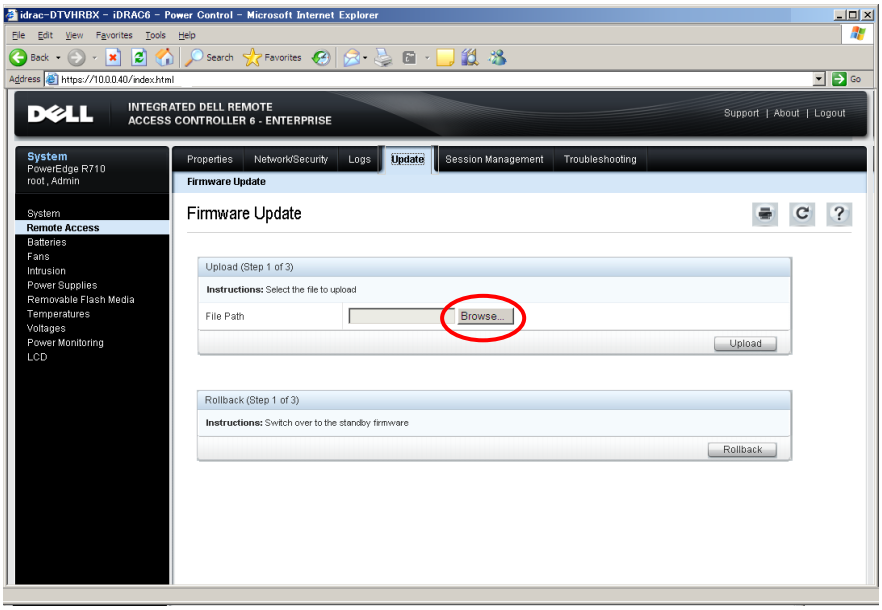

Figure B.2.2-5 Firmware Update window 1

(9) After selecting the firmware, click [Upload] button.

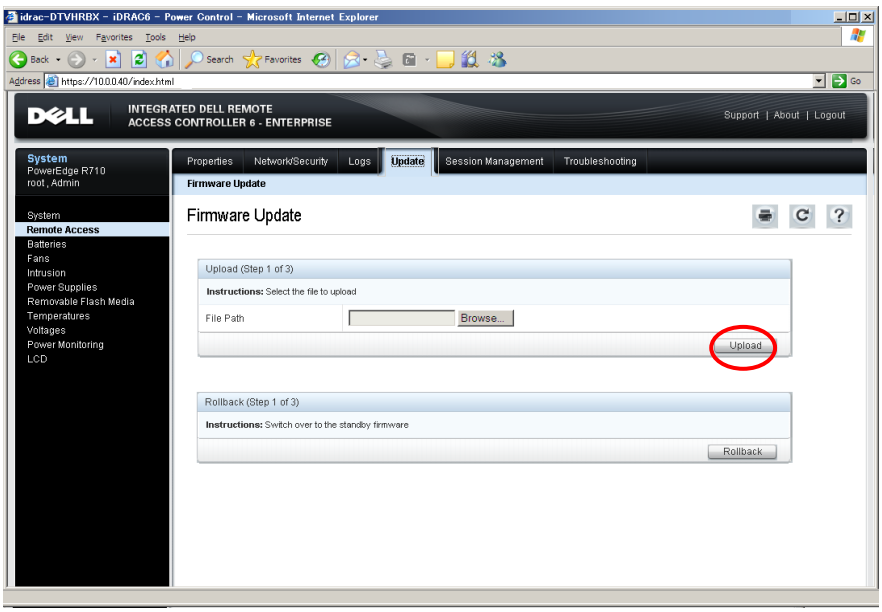

Figure B.2.2-6 Firmware Update window 2

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(10) The File Upload window 3 is displayed as shown in Figure B.2.2-7.
The file upload processing may take a few minutes.

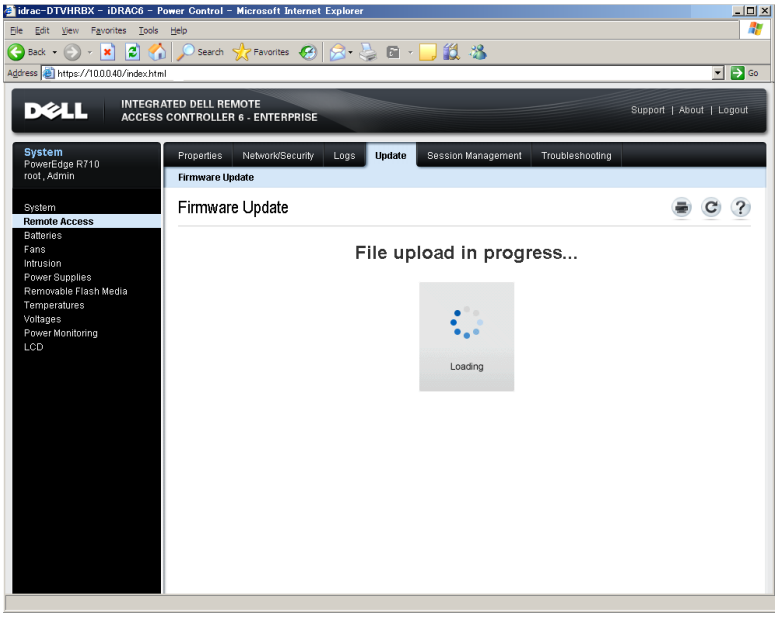

Figure B.2.2-7 File Upload window 3

(11) When the file upload is completed, the Status (2 of 3) window is displayed as shown in Figure B.2.2-8.
Check the version to update, and click [Next] button.
If the version to update differs, click [Cancel] button and execute from step (8) again.
If the file stored in the maintenance PC is incorrect, execute from step (1) again.

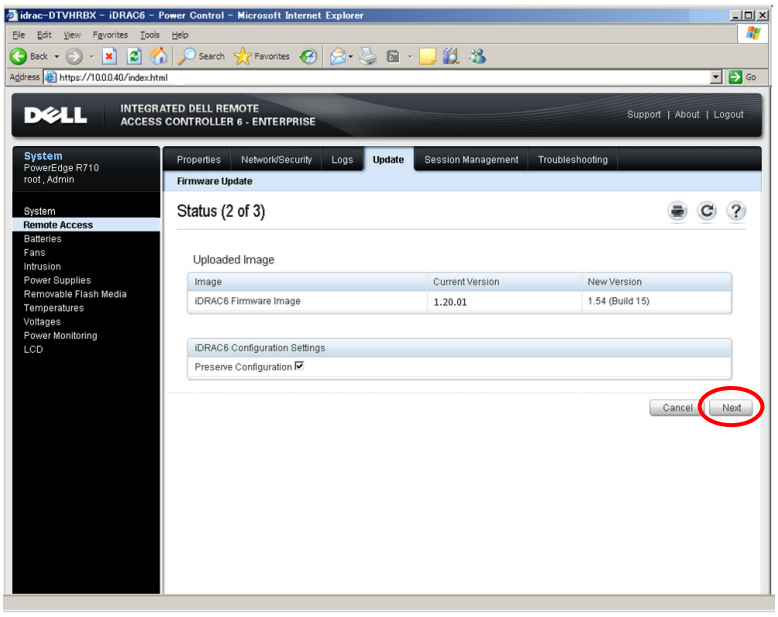

Figure B.2.2-8 Status (2 of 3) window

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(12) The Update Confirmation Dialog is displayed as shown in Figure B.2.2-9.
Click [OK] button.

Figure B.2.2-9 Update Confirmation Dialog

(13) The Updating (Step 3 of 3) window 1 is displayed as shown in Figure B.2.2-10.
Wait until the progress display shows 100%.

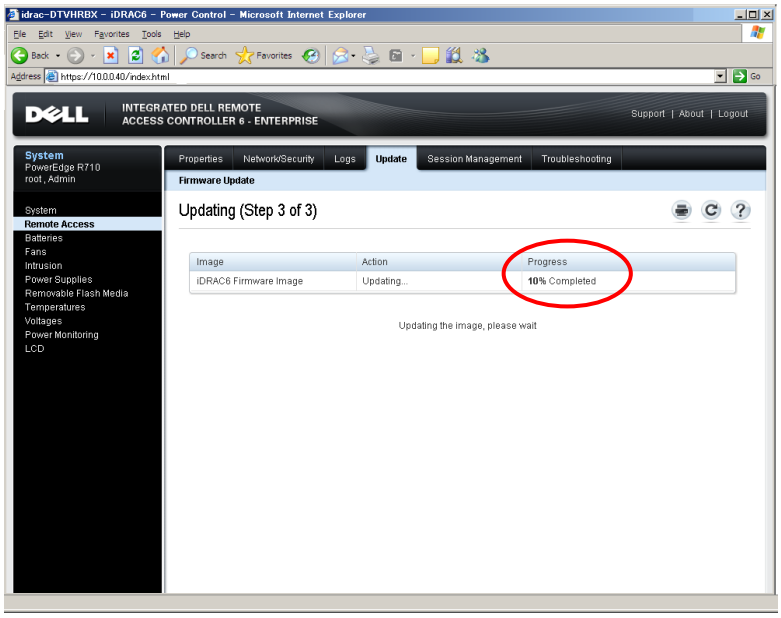

Figure B.2.2-10 Updating (Step 3 of 3) window 1

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(14) When the progress display shows 100%, the Updating (Step 3 of 3) window 2 is displayed as shown in Figure B.2.1-11. When the update is completed, the BMC is automatically reset.
Close the Internet Explorer window.

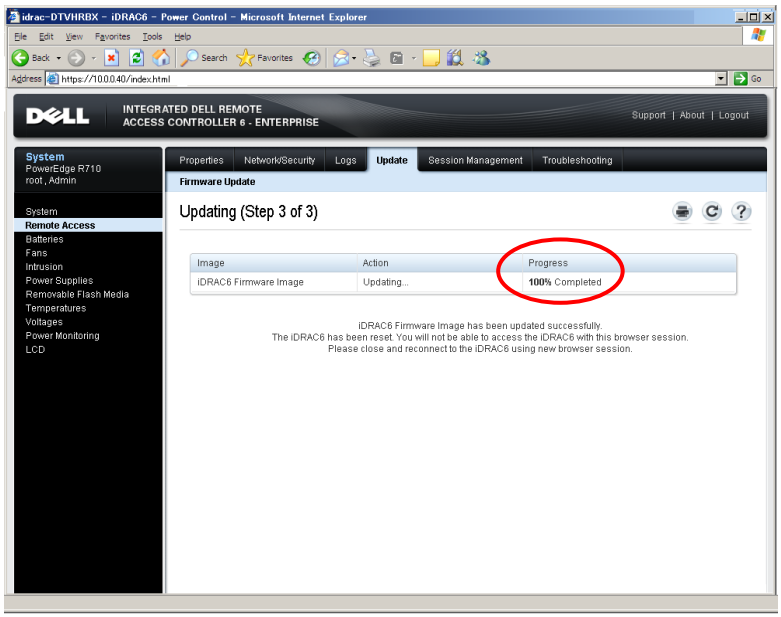

Figure B.2.2-11 Updating (Step 3 of 3) window 2

(15) Check the firmware update of BMC.
After waiting for about one minute, start Internet Explorer again.
Click [Start] - [Program] - [Internet Explorer].

(16) Enter the following address in the address bar of Internet Explorer.
“https://<IP address of updated BMC>”

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(17) Check that the BMC Login window is displayed.
If the BMC Login window is not displayed, wait for a while, and then execute step (16) again.

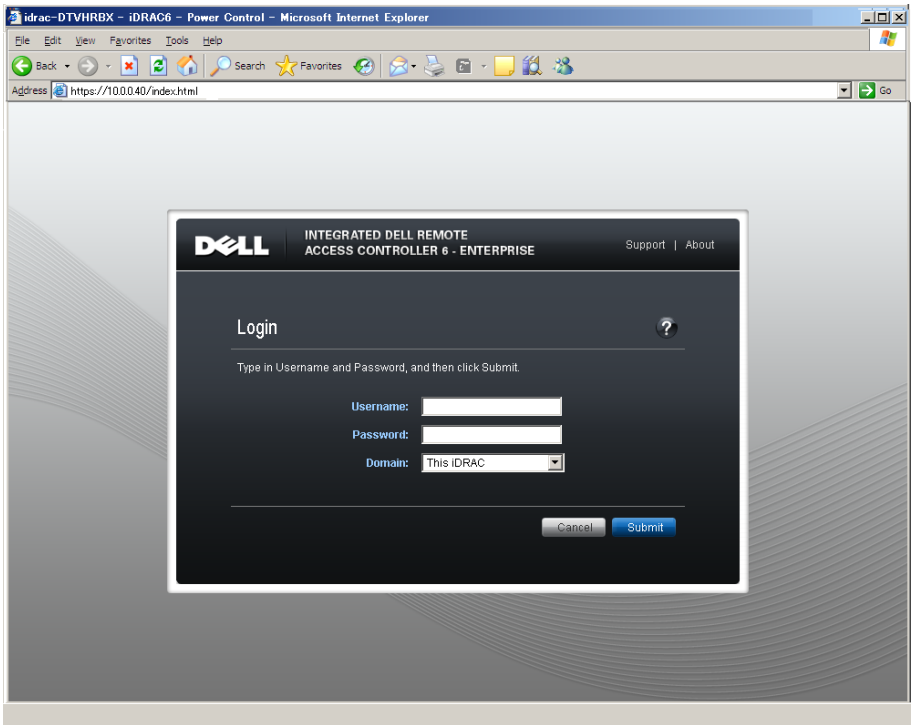

Figure B.2.2-12 BMC Login window 1

(18) Enter “root” in [Username] and “calvin” in [Password].
Select “This iDRAC” for [Domain].
After entering them, press [Submit] button.

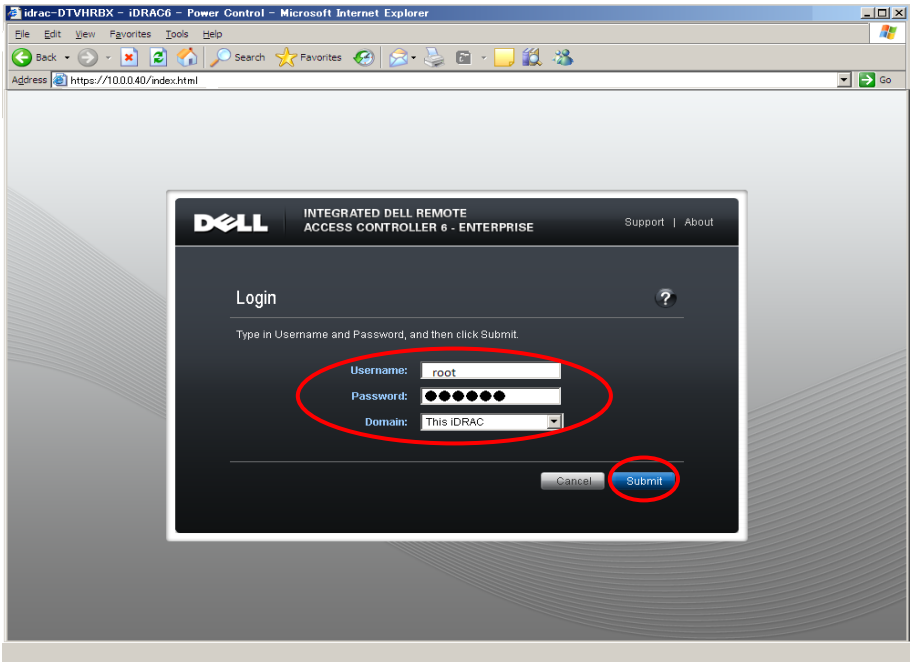

Figure B.2.2-13 BMC Login window 2

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(19) The System Summary window is displayed as shown in Figure B.2.2-14.
Click [Remote Access].

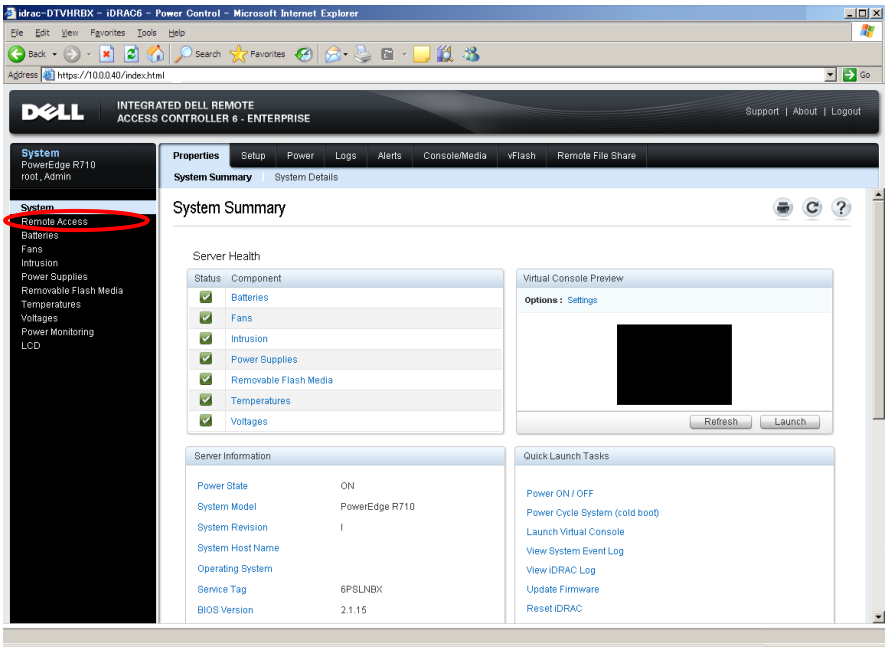

Figure B.2.2-14 System Summary window

(20) The iDRAC Information window is displayed as shown in Figure B.2.2-15.
Check [Firmware Version], and confirm that it is the updated version.

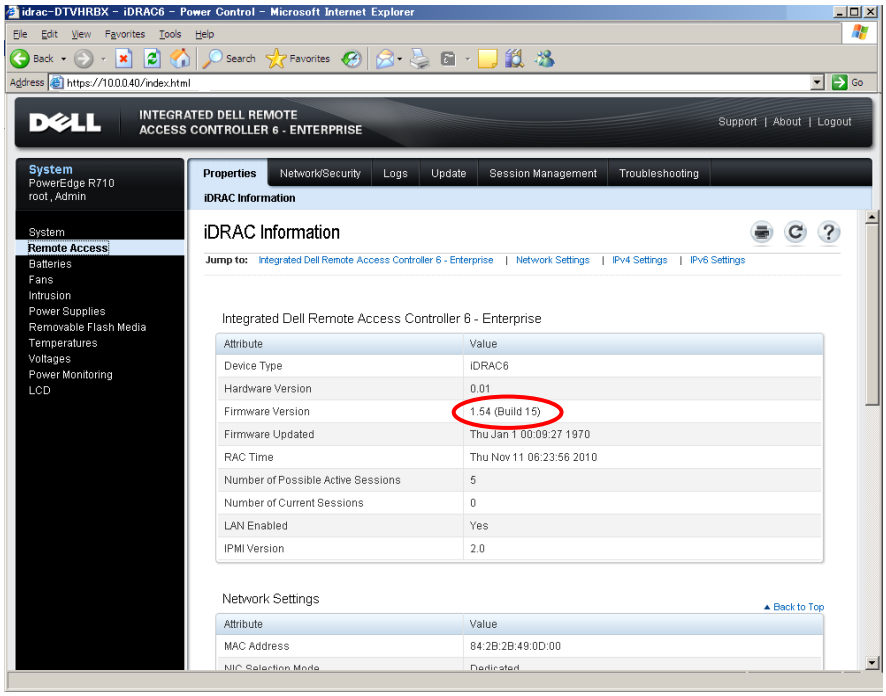

Figure B.2.2-15 iDRAC Information window

(21) After completing the BMC update procedure, return the network connection and the maintenance PC setting to the original.

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B.2.3 BOOT Priority Order

NOTE:
- In order to check the BIOS version during the OS installation operation, you need to refer to the Version management table (Web).
- Before executing OS installation, it is needed to verify that the console window is available to use.
  [In the cluster configuration]
  Open the console window of KVM, and execute the procedure (1).
  For the KVM connection, refer to ‘B.1.1 Confirmation of KVM Connection’.
  [In the single node configuration]
  Open the remote console window, and execute the procedure (1).
  For the remote console connection, refer to ‘B.1.3 Connection Confirmation of the Remote Console’.

(1) Stop the OS of the node with referring to “Installation ‘2.1 Procedure for Turning on and off the Power’ (INST 02-0000)”. If the Power lamp is turned off, execute the procedure step (2). When the main menu window is already displayed, proceed to step (3).

(2) Press the power button to turn on the power to the node.
For the location of the power indicator, refer to “Installation ‘2.1 Procedure for Turning on and off the Power’ (INST 02-0000)”.

(3) If “F2 = System Setup” is displayed on the upper right of the console window while the OS of the node is starting up, press [F2] key.
If [F2] key cannot be pressed, execute from step (1) again.

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(4) The BIOS Setup Utility window is displayed as shown in Figure B.2.3-1.
Select [System Security], and press [Enter] key.

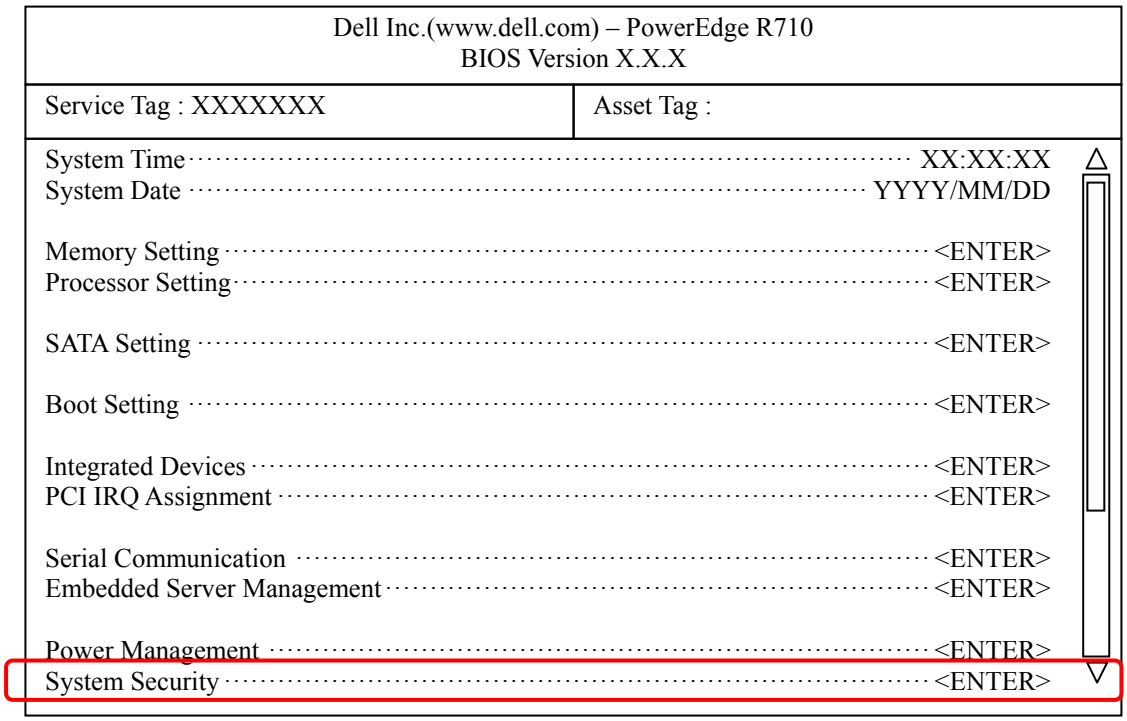

Figure B.2.3-1 BIOS Setup Utility window

NOTE: For the detailed operation method of BIOS Setup Utility, refer to the following "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" provided by the hardware vendor.

(5) The System Security window is displayed as shown in Figure B.2.3-2.
Select [NMI Button], and change the setting value to [Enabled].

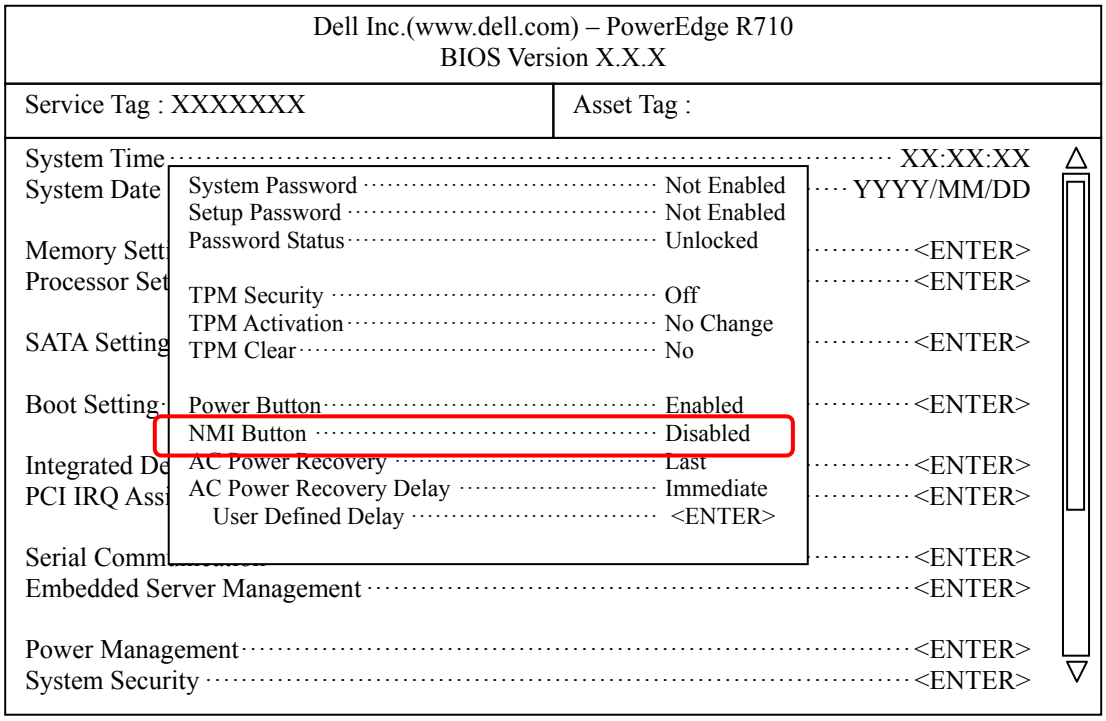

Figure B.2.3-2 System Security window

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(6) Press [Esc] key at the system security window as shown in Figure B.2.3-2.
It returns to the window of Figure B.2.3-1 BIOS setup utility.

(7) The BIOS setup utility window is displayed as shown in Figure B.2.3-3.
Select [Boot Settings], and press [Enter] key.

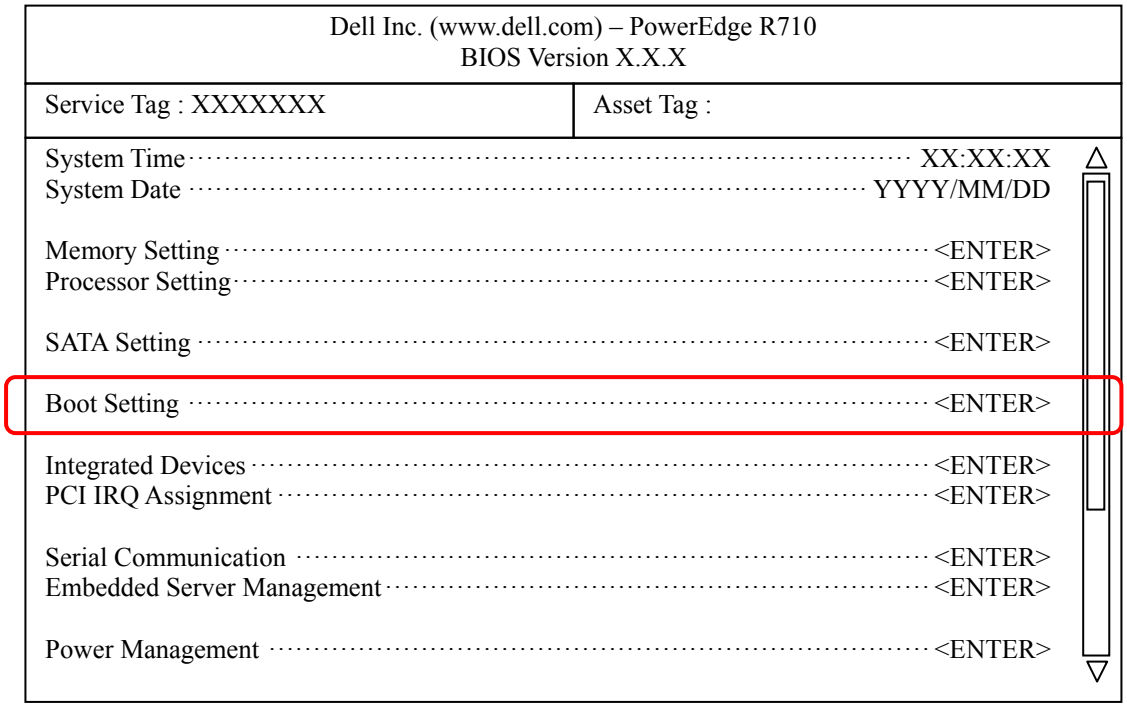

Figure B.2.3-3 BIOS Setup Utility window

NOTE: At the time of executing the OS installation operation or the OS updating operation, check the Version management table (Web), and if the [BIOS Version] is a version which needs to be updated, refer to 'B.2.1 BIOS Version Checking Procedure' and update the BIOS Version.

(8) The boot settings window is displayed as shown in Figure B.2.3-4.
Select [Boot Sequence], and press [Enter] key.

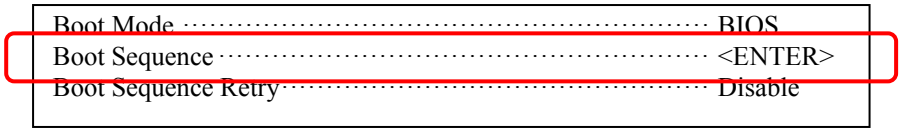

Figure B.2.3-4 Boot Settings window

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(9) The Boot sequence window is displayed as shown in Figure B.2.3-5.
Check that the displayed items are listed as shown in Figure B.2.3-5.
If the display order differs, sort them by using the [+] key and the [-] key.
If the [√] sign is not on the far left of the displayed item, the device is disabled. Place the [√] sign by pressing the [Space] key.

NOTE: When entering characters in the BIOS Setup Utility window, the keyboard layout is recognized as the 101 keyboard (QWERTY based layout).

```
√1.SATA Optical drive
√2.Hard drive C:(Integrated RAID PERC 6/5 Integrate)
√3.Embedded NIC IMBA v5.0.5 Slot 0100
```

Figure B.2.3-5 Boot Sequence window

(10) Press [Esc] key in the boot sequence window as shown in Figure B.2.3-5.
It returns to the boot settings window as shown in Figure B.2.3-4.

(11) Press [Esc] key in the boot settings window as shown in Figure B.2.3-4.
It returns to the BIOS setup utility window as shown in Figure B.2.3-6.

```
Dell Inc.(www.dell.com) – PowerEdge R710
BIOS Version X.X.X

Service Tag : XXXXXXX        Asset Tag :

System Time ..................... XX:XX:XX
System Date ..................... YYYY/MM/DD

Memory Setting ................... <ENTER>
Processor Setting ................ <ENTER>

SATA Setting ..................... <ENTER>

Boot Setting ..................... <ENTER>

Integrated Devices ............... <ENTER>
PCI IRQ Assignment ............... <ENTER>

Serial Communication ............. <ENTER>
Embedded Server Management ....... <ENTER>

Power Management ................. <ENTER>
```

Figure B.2.3-6 BIOS Setup Utility window

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(12) Press [Esc] key in the BIOS setup utility window as shown in Figure B.2.3-6.
The BIOS setup utility termination confirmation window is displayed as shown in Figure B.2.3-7.

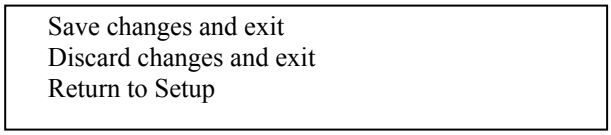

Figure B.2.3-7 BIOS Setup Utility Termination Confirmation window

(13) The procedure differs whether the setting was changed in step (9) or not.
(a) If the setting was changed in step (9), select "Save changes and exit" and press [Enter] key.

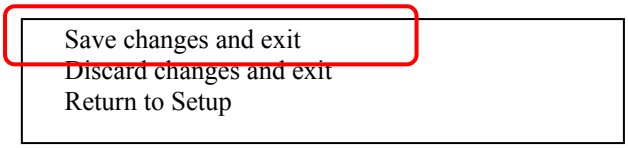

Figure B.2.3-8 BIOS Setup Utility Termination Confirmation Window (a)

(b) If the setting was not changed in step (9), select "Discard changes and exit" and press [Enter] key.

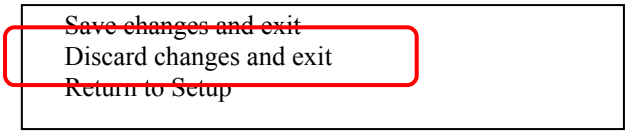

Figure B.2.3-9 BIOS Setup Utility Termination Confirmation Window (b)

(14) Return to the caller of the BOOT priority order and execute the rest of the operations.

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B.2.4 Set the Time in BIOS

Set the time in BIOS.
To obtain the time to enter, it is required to display "Set Up 'Figure 9.1-7 "Date and Time" window 4' (SETUP 09-0030)" or run the timeget-u command on the other side node in advance.

NOTE: The timeget-u command can be run only when the mother board is replaced.

(1) Start the node. When "F2 = System Setup" is displayed at the upper right of the console window, press [F2] key.
When the BIOS setting utility window is already running, proceed to step (2).

(2) In the BIOS Setup Utility window (Figure B.2.4-1), select "System Time", press [Enter] key, and then manually enter the UTC time that is obtained from/by either of the following:
The difference between the entered time and the obtained UTC time must be within 10 seconds.
- "Set Up 'Figure 9.1-7 "Date and Time" window 4' (SETUP 09-0030)"
- Running the timeget-u command on the other side node
  Refer to "Maintenance Tool '2.42 Acquisition of Time/Time Zone (timeget)' (MNTT 02-2430)" for details.

(3) In the BIOS Setup Utility window (Figure B.2.4-1), select "System Date", press [Enter] key, and then manually enter the UTC date that is obtained by the same procedure as the step (2) above.

(4) In the BIOS Setup Utility window (Figure B.2.4-1), press the [Esc] key.

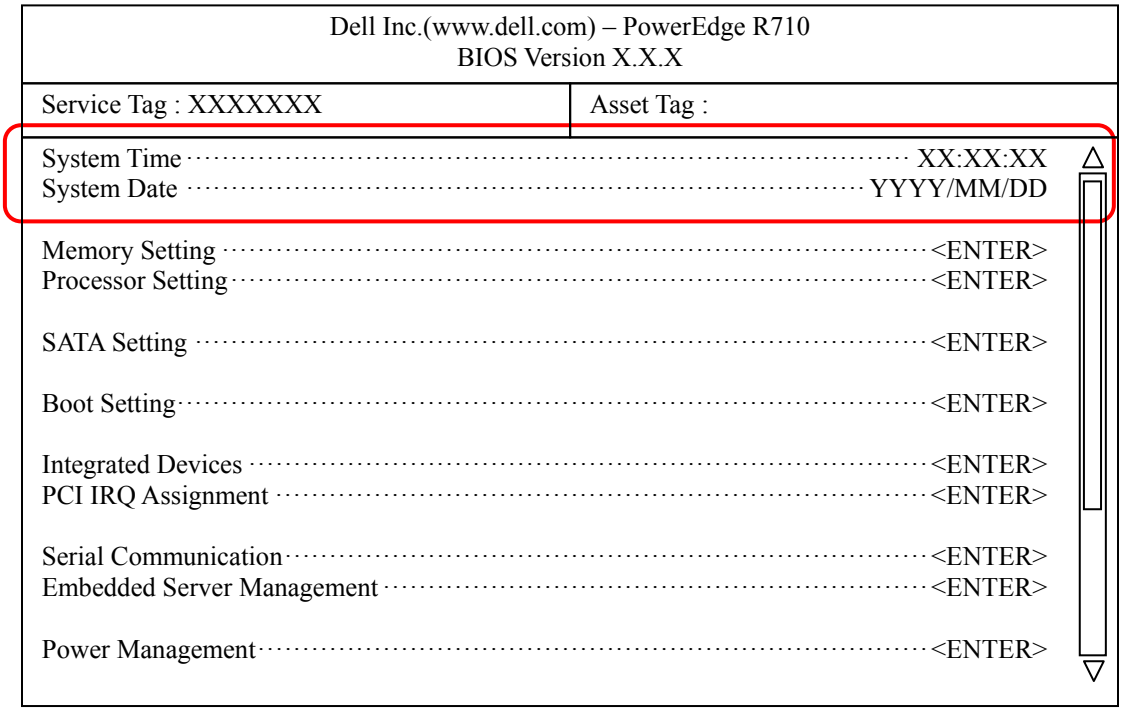

Figure B.2.4-1 BIOS Setup Utility window

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(5) When the BIOS setup utility termination confirmation window (Figure B.2.4-2), select “Save changes and exit”, and press [Enter] key.
Pressing [Enter] key automatically restarts the node.

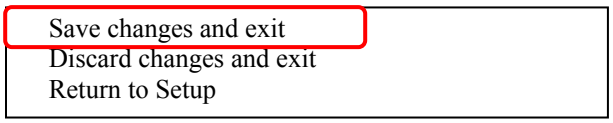

Figure B.2.4-2 BIOS Setup Utility Termination Confirmation window

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B.2.5 BMC Setting Procedure

NOTE: Before executing BMC setting, it is needed to verify that the console window is available to use.

[In the cluster configuration]
Open the console window of KVM, and execute the procedure (1).
For the connection of KVM, refer to 'B.1.1 Confirmation of KVM Connection'.
[In the single node configuration]
Open the remote console window, and execute the procedure (1).
For the connection of remote console, refer to 'B.1.3 Connection Confirmation of the Remote Console'.

(1) Refer to "Installation '2.1 Procedure for Turning on and off the Power' (INST 02-0000)", and turn on the power of the node.

(2) When the BMC setting login display window is displayed as shown in Figure B.2.5-1, press the [Ctrl] + [E] keys.
If the [Ctrl]+[E] keys cannot be pressed, reboot the node by pressing the [Ctrl]+[Alt]+[Del] keys, and then execute from step (2) again.

```
iDRAC6 Configuration Utility X.XX
Copyright 2009 Dell Inc. All Rights Reserved
iDRAC6 Firmware Revision version: X.XX.XX

-------------------------------
    IPv6 Settings
-------------------------------
 IPv6 Stack      : Disabled
 Address 1       : ::
 Default Gateway : ::
-------------------------------
    IPv4 Settings
-------------------------------
 IPv4 Stack      : Enabled
 IP Address      : 192.168.0.120
 Subnet mask     : 255.255.255.0
 Default Gateway : 192.168.0.1
press <ctrl-E> for Remote Access Setup within 5sec....
```

Figure B.2.5-1 BMC Setting Login Display window

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(3) The BMC setting window is displayed as shown in Figure B.2.5-2
Check whether the version described in [iDRAC6 Firmware Revision] is the version which requires the update or not.
To check the version, refer to the version management table (Web).
If the firmware update is required, refer to 'B.2.2 BMC Firmware Version Checking Procedure', and update the firmware.

```
                    iDRAC6 Configuration Utility

              Copyright2009 Dell Inc. All Rights Reserved X.XX

iDRAC6 Firmware Revision                                  X.XX.XX
Primary Backplane Firmware revision                       X.XX

iDRAC6 LAN ..............................................  ON
IPMI OVER LAN ...........................................  Off
LAN Parameters ..........................................  <ENTER>
Virtual Media Configuration .............................  <ENTER>
Smart Card Logon ........................................  <ENTER>
System Services .........................................  <ENTER>
LCD Configuration .......................................  <ENTER>
LAN User Configuration ..................................  <ENTER>
Reset To Default ........................................  <ENTER>
System Event Log Menu ...................................  <ENTER>
```

Figure B.2.5-2 BMC Setting window

NOTE: For the detailed operation method of iDRAC Setting Utility used in step (3) to step (10), refer to "Integrated Dell™ Remote Access Controller 6 (iDRAC6) User Guide" provided by the hardware vendor.

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(4) Check whether the display of [IPMI OVER LAN] is [ON] or not.
If it is [OFF], press the [Space] key and switch it to [ON].
In the cluster configuration, proceed to step (5).
In the single node configuration, proceed to step (8).

```
iDRAC6 Configuration Utility

Copyright2009 Dell Inc. All Rights Reserved X.XX

iDRAC6 Firmware Revision                                  X.XX.XX
Primary Backplane Firmware revision                       X.XX

iDRAC6 LAN                                                ON
IPMI OVER LAN ..............................................Off
LAN Parameters .............................................<ENTER>
Virtual Media Configuration ................................<ENTER>
Smart Card Logon ...........................................<ENTER>
System Services ............................................<ENTER>
LCD Configuration ..........................................<ENTER>
LAN User Configuration .....................................<ENTER>
Reset To Default ...........................................<ENTER>
System Event Log Menu ......................................<ENTER>
```

Figure B.2.5-3 BMC Setting window

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(5) Select [LAN User Configuration] in Figure B.2.5-4 BMC setting window, and then press the [Enter] key.

```
iDRAC6 Configuration Utility
Copyright2009 Dell Inc. All Rights Reserved X.XX

iDRAC6 Firmware Revision                                  X.XX.XX
Primary Backplane Firmware revision                       X.XX
---------------------------------------------------------------------
iDRAC6 LAN ..................................................... ON
IPMI OVER LAN................................................... ON
LAN Parameters...............................................<ENTER>
Virtual Media Configuration..................................<ENTER>
Smart Card Logon.............................................<ENTER>
System Services .............................................<ENTER>
LCD Configuration ...........................................<ENTER>
LAN User Configuration ......................................<ENTER>
Reset To Default ............................................<ENTER>
System Event Log Menu .......................................<ENTER>
```

Figure B.2.5-4 BMC Setting window

(6) The BMC user account setting window is displayed as shown in Figure B.2.5-5.
Enter the following character strings in [Account User Name], [Enter Password] and [Confirm Password].

Account User Name : nasroot-remote
Enter Password : c3starbmc
Confirm Password : c3starbmc (All must be lower-case characters)

NOTE:
- When entering other than the specified name and the password, information acquisition from the OS via BMC fails.
  Be sure to enter the specified user name and the password.
- The maintenance personnel enter the user name and the password.
  No one except for the maintenance personnel uses the user name and the password.
  The maintenance personnel must be careful to manage the user name and the password not to be leaked.

```
Auto-Discovery          Disabled
Account Access          Enabled
IPMI LAN Privilege      Admin
-------------------------------------
Account User Name       [nasroot-remote]
Enter Password          [*********]
Confirm Password        [*********]
```

Figure B.2.5-5 BMC User Account Setting window

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(7) Press the [Esc] key in the BMC user account setting window as shown in Figure B.2.5-5.
It returns to the BMC setting window as shown in Figure B.2.5-6.

```
iDRAC6 Configuration Utility

Copyright2009 Dell Inc. All Rights Reserved X.XX

iDRAC6 Firmware Revision                                  X.XX.XX
Primary Backplane Firmware revision                       X.XX

iDRAC6 LAN ..................................................... ON
IPMI OVER LAN .................................................. ON
LAN Parameters ..............................................<ENTER>
Virtual Media Configuration .................................<ENTER>
Smart Card Logon ............................................<ENTER>
System Services .............................................<ENTER>
LCD Configuration ...........................................<ENTER>
LAN User Configuration ......................................<ENTER>
Reset To Default ............................................<ENTER>
System Event Log Menu .......................................<ENTER>
```

Figure B.2.5-6 BMC Setting window

(8) When pressing the [Esc] key in the BMC setting window as shown in Figure B.2.5-6, the BMC setting termination window is displayed as shown in Figure B.2.5-7.

```
Save changes and exit
Discard changes and exit
Return to Setup
```

Figure B.2.5-7 BMC Setting Termination window

(9) Connect the maintenance PC and perform confirmation after the BMC setting.
Connect the maintenance PC directly to the BMC port.
After connecting the maintenance PC, check that the LAN port of the maintenance PC links up, and execute step (10) and the following steps.

(10) Assign the address belonging to the same network segment as the IP address of the BMC port to the IP address of the maintenance PC.

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(11) Check whether it is possible to communicate from the maintenance PC to the BMC IP address or not.
The example for checking is shown below.

Click [Start] - [Program] - [Accessory] - [Command Prompt].
The command prompt window is opened.
Enter “ping <IP address of BMC>” in the command prompt window, and press [Enter] key.
The execution result when the BMC IP address is [192.168.0.22] is shown in Figure B.2.5-8 ping Command Execution Example.

```
C:\>ping 192.168.0.22

Pinging 192.168.0.22 with 32 bytes of data:

Reply from 192.168.0.22: bytes=32 time<1ms TTL=128
Reply from 192.168.0.22: bytes=32 time<1ms TTL=128
Reply from 192.168.0.22: bytes=32 time<1ms TTL=128
Reply from 192.168.0.22: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.0.22:
   Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
   Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Figure B.2.5-8 ping Command Execution Example

If it is not possible to communicate with BMC as shown in Figure B.2.5-9 ping Command Failure Example, review the IP address setting and network setting of the maintenance PC.
If there is no problem, restart from step (3).

```
C:\>ping 192.168.0.22

Pinging 192.168.0.22 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.0.22:
   Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Figure B.2.5-9 ping Command Failure Example

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(12) Start Internet Explorer in the maintenance PC.
Click [Start] - [Program] - [Internet Explorer].

(13) Enter the following address in the address bar of Internet Explorer.
“https://<IP address of BMC>”

(14) Check that the BMC Login window 1 is displayed as shown in Figure B.2.5-10.

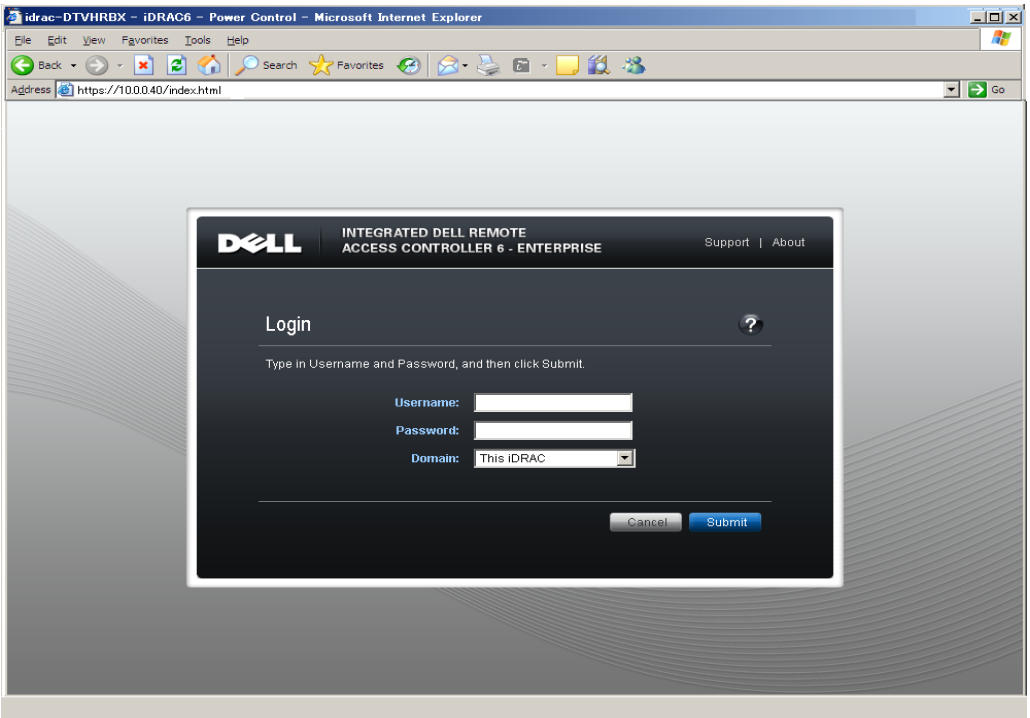

Figure B.2.5-10 BMC Login window 1

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(15) Enter “nasroot-remote” in [Username] and “c3starbmc” in [Password] in the case of cluster configuration.
Enter “root” in [Username] and “calvin” in [Password] in the case of single node configuration.
Select “This iDRAC” for [Domain].
After entering them, then press [OK].
If you cannot log in, enter [Username] and [Password] again and press [OK].
Even if you still cannot log in, restart from step (3).

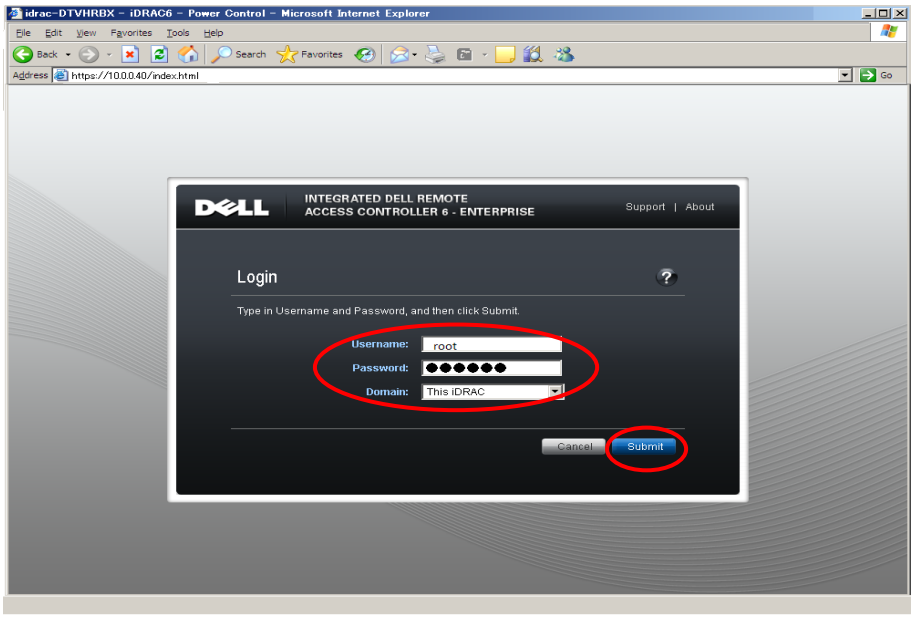

Figure B.2.5-11 BMC Login Window 2

(16) The system summary window is displayed as shown in Figure B.2.5-12.
Click [Remote Access].

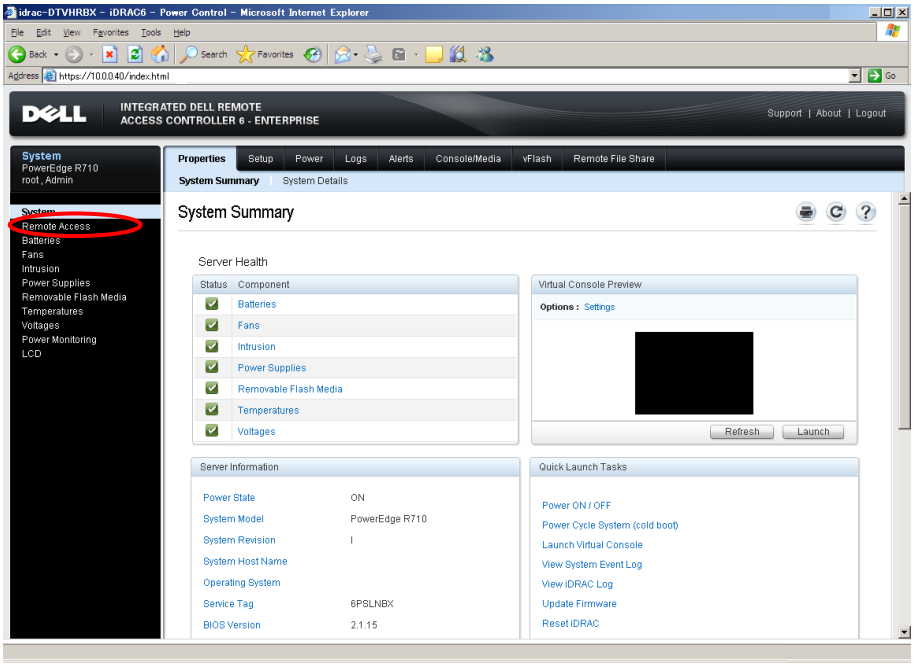

Figure B.2.5-12 System Summary window

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(17) The iDRAC information window is displayed as shown in Figure B.2.5-13.
Click the [Network/Security] tab.

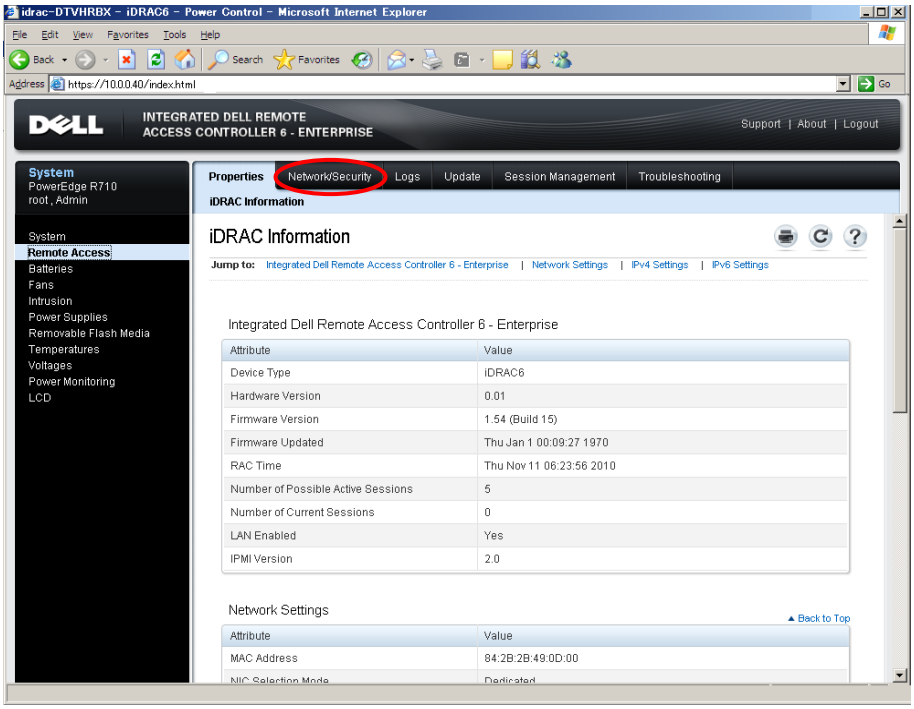

Figure B.2.5-13 iDRAC Information window

(18) The network window is displayed as shown in Figure B.2.5-14.
Confirm that the "Enable IPMI Over LAN" check box of the [IPMI Setting] is checked. If it is not checked, check it and press [Apply].

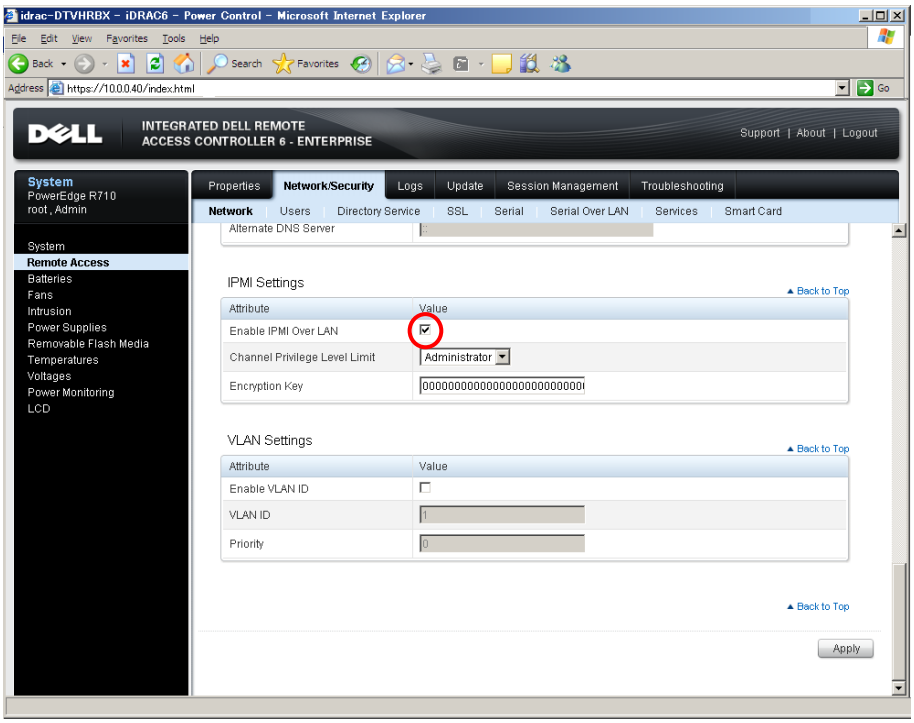

Figure B.2.5-14 Network window 1

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(19) Click [System] in the network window2 as shown in FigureB.2.5-15.

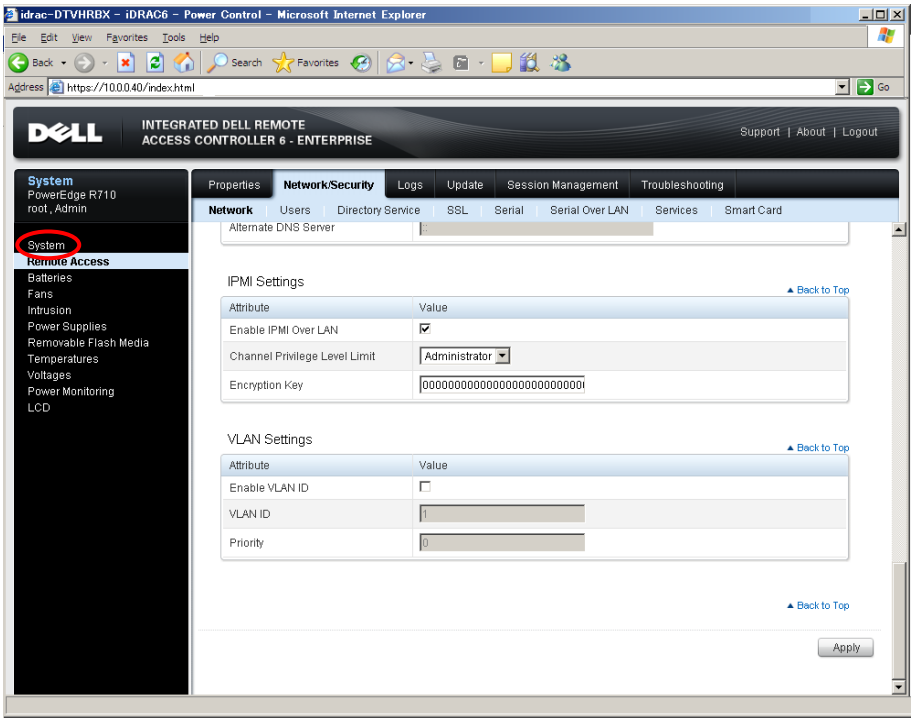

Figure B.2.5-15 Network window 2

(20) The system summary window is displayed as shown in Figure B.2.5-16.
Click [Power] tab.

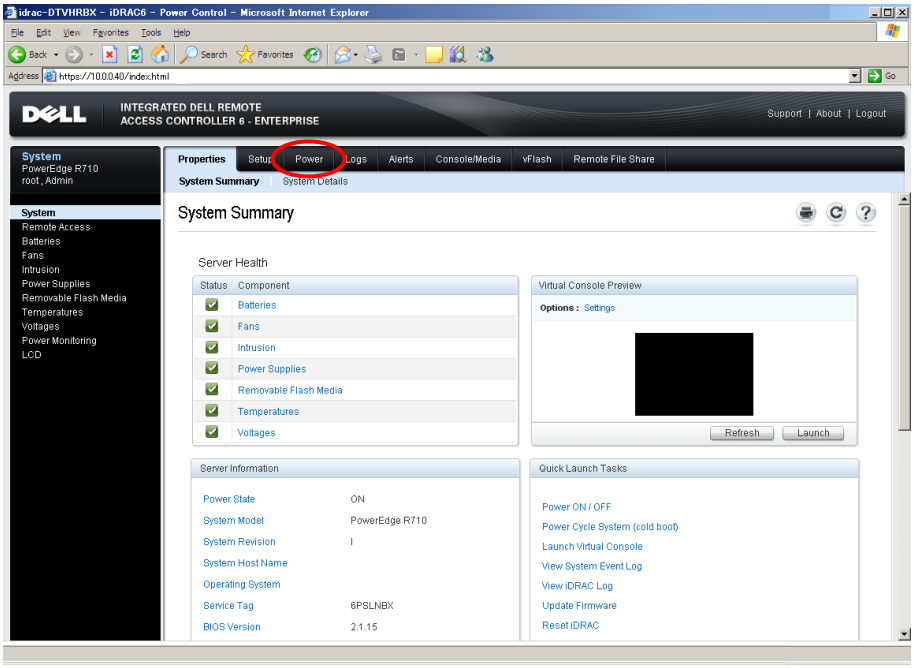

Figure B.2.5-16 System Summary window

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(21) The power control window is displayed as shown in Figure B.2.5-17.
Check "Power Off System" on the [Power Control Operations] check list, and press [Apply].

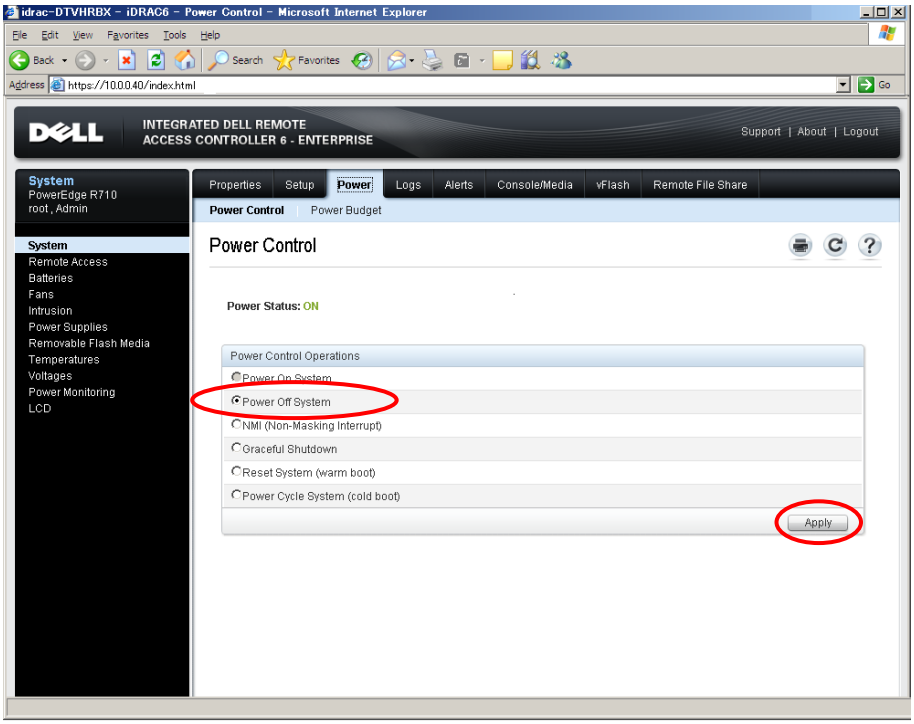

Figure B.2.5-17 Power Control Window

(22) Check that the power indicator of the node is turned off.
For the position of the power indicator, refer to "Installation '2.1 Procedure for Turning on and off the Power' (INST 02-0000)".

(23) After confirming that the power indicator of the node is turned off, press [Logout] on the upper right of the power control window as shown in Figure B.2.5-17 and log out.

(24) Proceed to "Set Up '3.2 The node Status Confirmation before Installation' (SETUP 03-0010)".

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B.2.6 RAID Controller Setting

B.2.6.1 Virtual disk setting confirmation

NOTE: Open the KVM console window, and then execute step (1).

(1) Refer to "Installation '2.1 Procedure for Turning on and off the Power' (INST 02-0000)", and turn on the power of the node.

(2) A while after the node starts, the virtual disk setting login window is displayed as shown in Figure B.2.6.1-1. Press [Ctrl] + [R] within five seconds.
If you could not press them, proceed to step (3). If you could press them, proceed to step (4).

```
PowerEdge Expandable RAID Controller BIOS
Copyright(c) 2008 LSI Corporation
Press <Ctrl><R> to Run Configuration Utility
```

Figure B.2.6.1-1 Virtual Disk Setting Login window

(3) If you could not press [Ctrl] + [R], reboot the node by pressing [Ctrl] + [Alt] + [Del] keys, and execute from step (2) again.

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(4) By pressing [Ctrl] + [R], the virtual disk management window is displayed as shown in Figure B.2.6.1-2. When [No Configuration Present!] is displayed under [Controller 0], refer to 'B.2.6.2 Virtual disk setting procedure' and perform the virtual disk setting.
When [No Configuration Present!] is not displayed under [Controller 0] and the virtual disk is set, proceed to step (5).

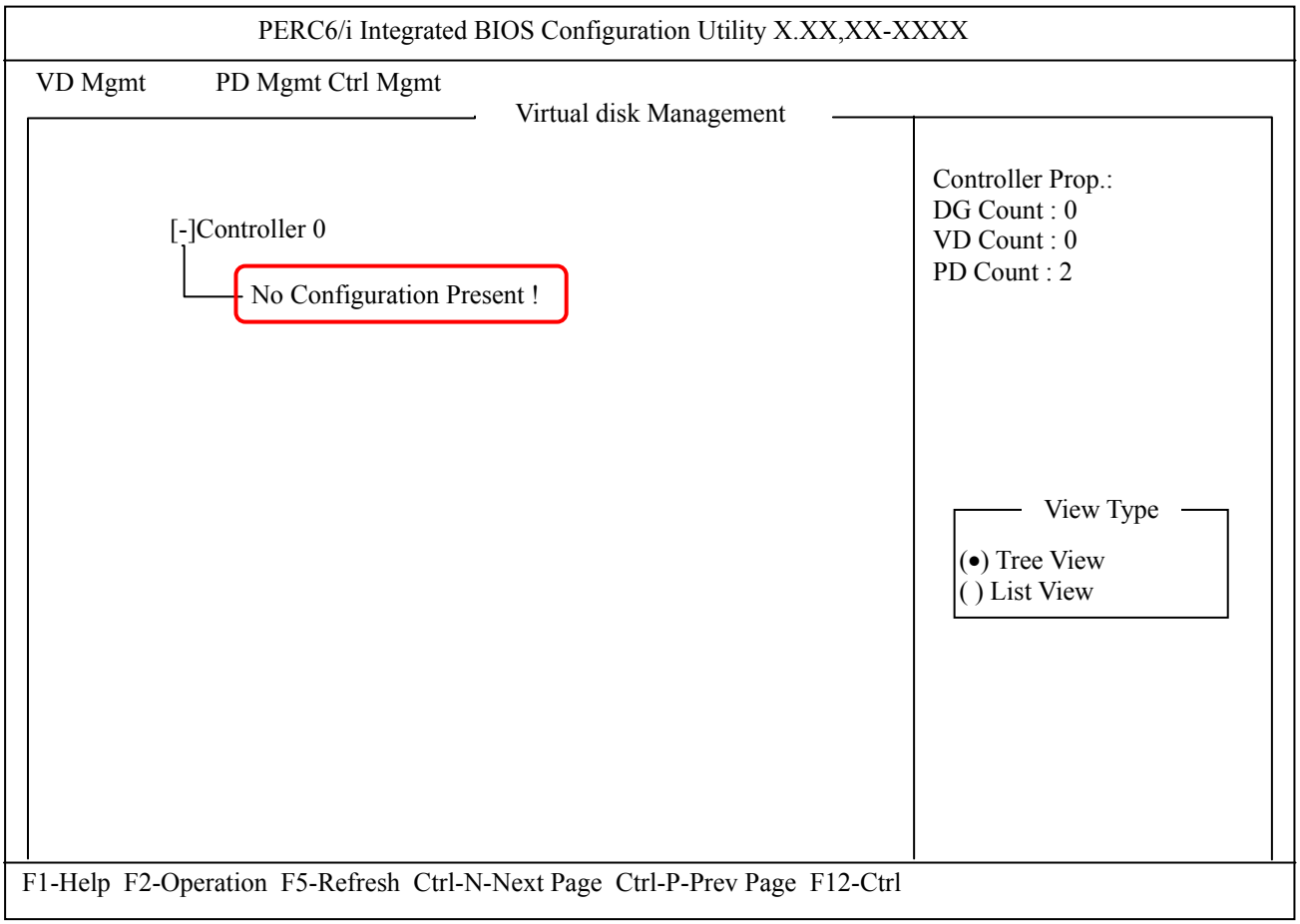

Figure B.2.6.1-2 Virtual Disk Management window

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(5) Select “Virtual Disk 0” by the arrow keys, and press the [F2] key.

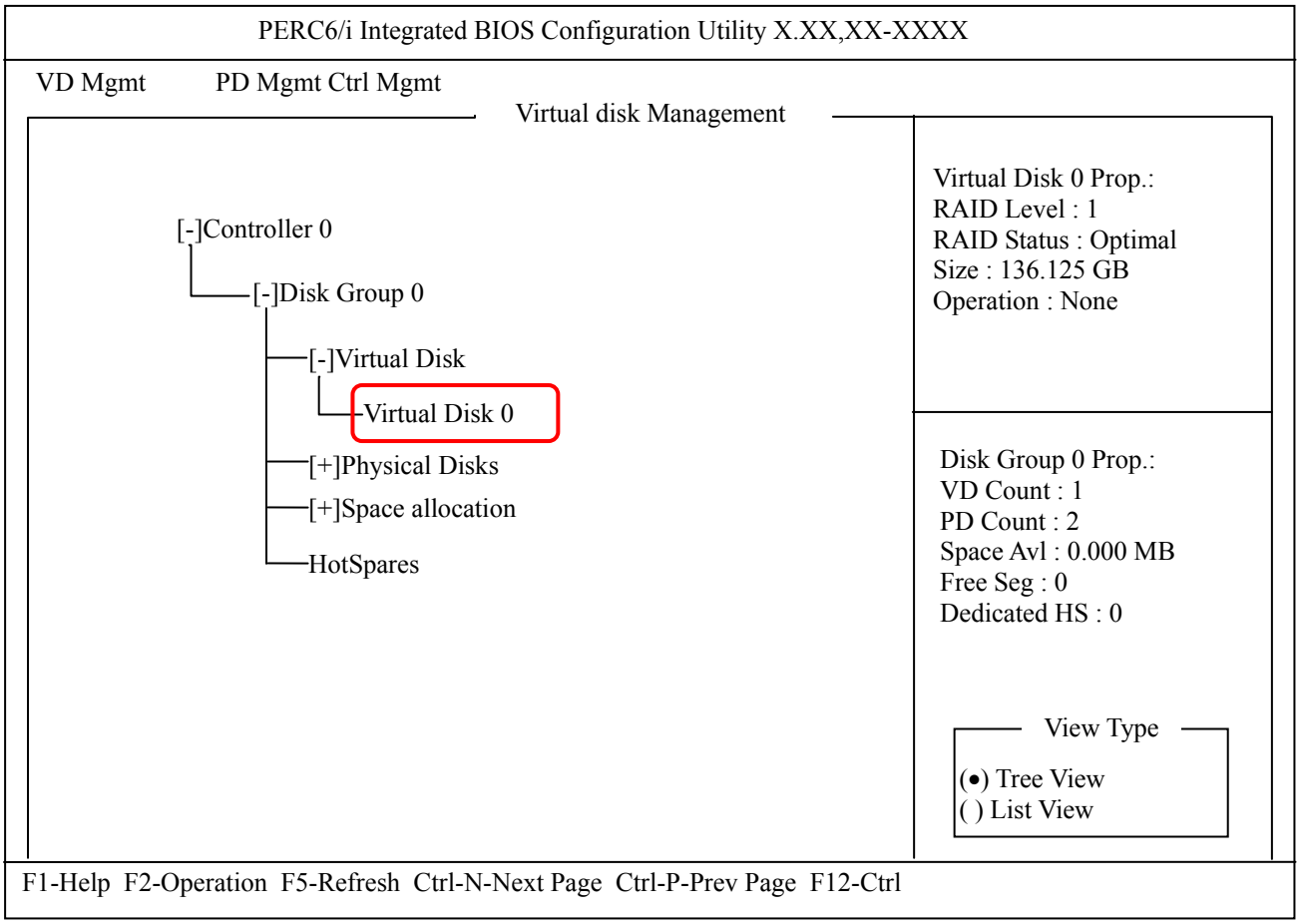

Figure B.2.6.1-3 Virtual Disk Management window

(6) The virtual disk 0 action window 1 is displayed as shown in Figure B.2.6.1-4.
Select “Properties” by the arrow key, and press the [Enter] key.

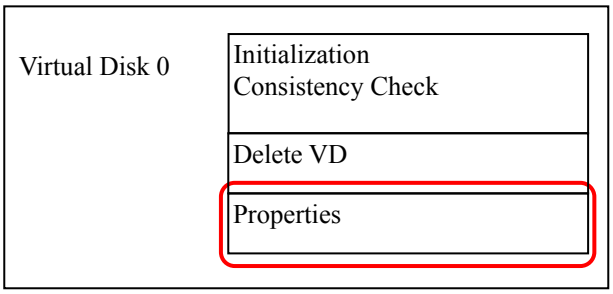

Figure B.2.6.1-4 Virtual Disk 0 Action window 1

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(7) Check that it is set as shown in the enclosed part of Figure B.2.6.1-5 Virtual Disk 0 Property window.

NOTE: In Figure B.2.6.1-5, if only one row is displayed for [Physical Disks], one HDD is not recognized.
Reboot the node by executing steps (8) and (9), and execute the procedures again beginning from step (2) of 'B.2.6.1 Virtual disk setting confirmation'.
If the HDD is still not recognized again, replace the internal HDD in reference to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual". When the display of [--:00:00] is shown in the [Drive ID] of the [Physical Disks], then replace the HDD in the hardware drive slot 1, and when the display of [--:00:01] is shown in it, then replace the HDD in the hardware drive slot 0.

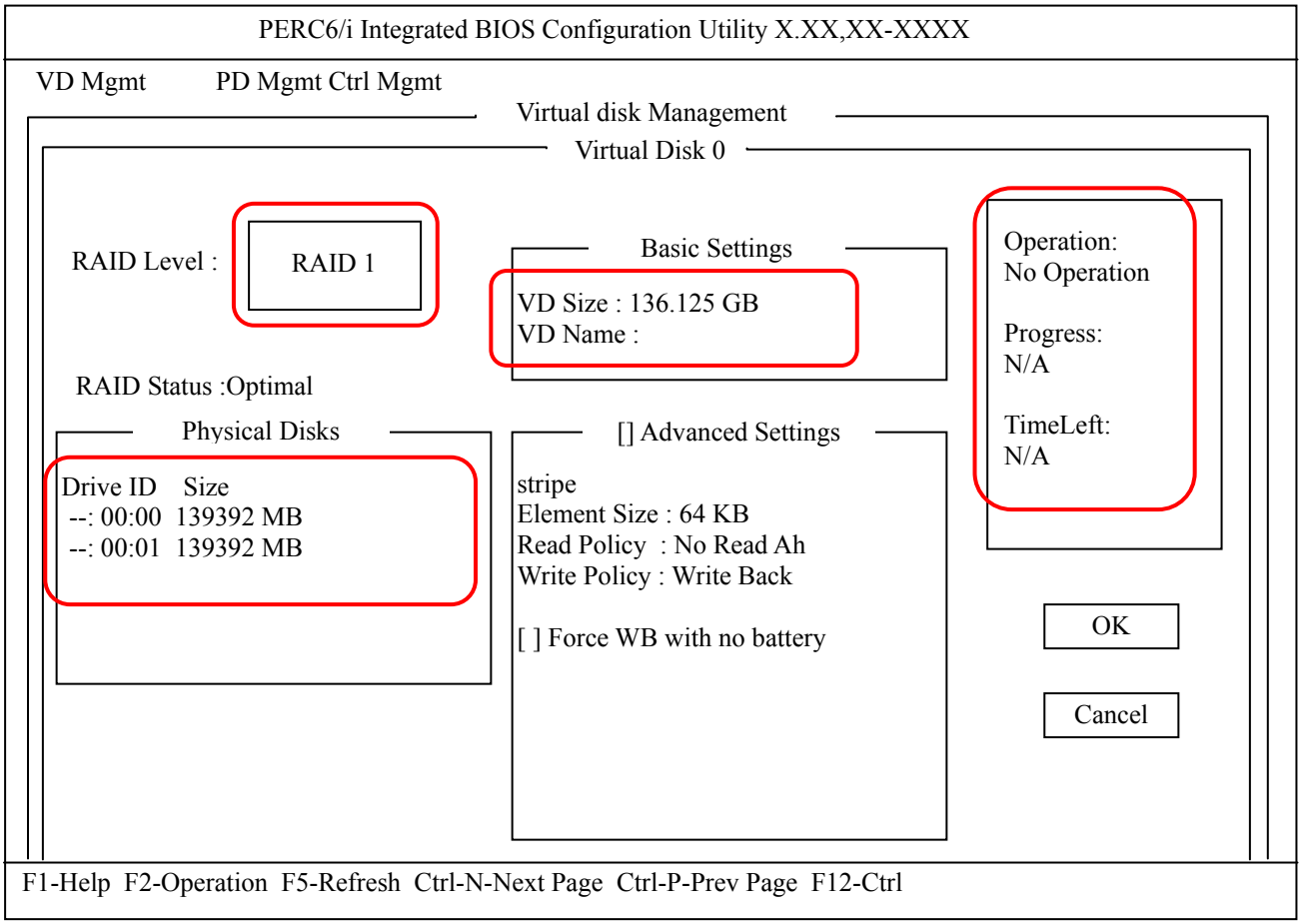

Figure B.2.6.1-5 Virtual Disk 0 Property window

If the setting is incorrect, proceed to step (11).

When you can confirm that it is correct, press [Esc] key and return to the virtual disk management window as shown in Figure B.2.6.1-3, and proceed to step (8).

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(8) Press [Esc] key in the virtual disk management window as shown in Figure B.2.6.1-3.
The virtual disk termination window is displayed as shown in Figure B.2.6.1-6.
Select [OK] by arrow keys, and press [Enter] key.

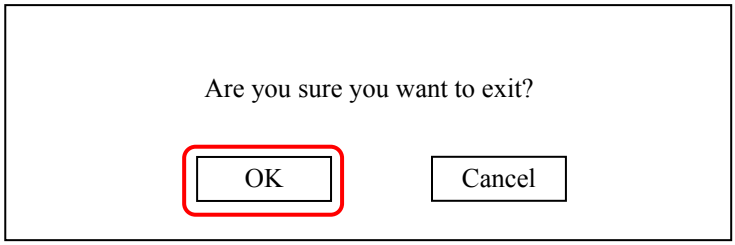

Figure B.2.6.1-6 Virtual Disk Termination window

(9) The node reboot execution window is displayed as shown in Figure B.2.6.1-7.
Press [Ctrl] + [Alt] + [Delete] to reboot.

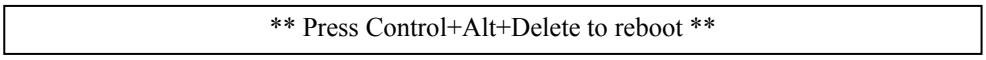

Figure B.2.6.1-7 node Reboot Execution window

(10) When the virtual disk confirmation is completed, return to "Set Up '3.1 Procedure before New Installation' (SETUP 03-0000)", and perform the following procedures.

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(11) Press [Esc] key, and return to the virtual disk management window as shown in Figure B.2.6.1-3.
Select “Virtual Disk 0” by arrow keys, and press [F2] key.
The virtual disk 0 action window 2 is displayed as shown in Figure B.2.6.1-8.
Select “Delete VD” by arrow keys, and press [Enter] key.

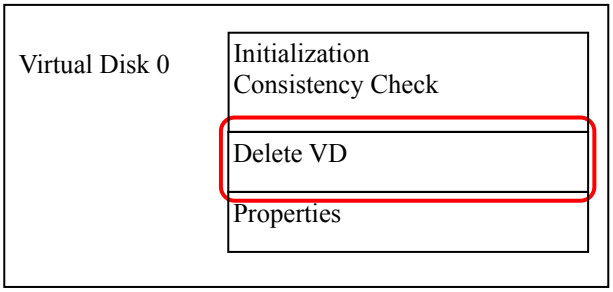

Figure B.2.6.1-8 Virtual Disk 0 Action window 2

(12) The delete virtual disk execution window is displayed as shown in Figure B.2.6.1-9.
Select [Yes] by arrow keys, and press [Enter] key.
As the virtual disk is deleted, refer to ‘B.2.6.2 Virtual disk setting procedure’, and perform the virtual disk setting.

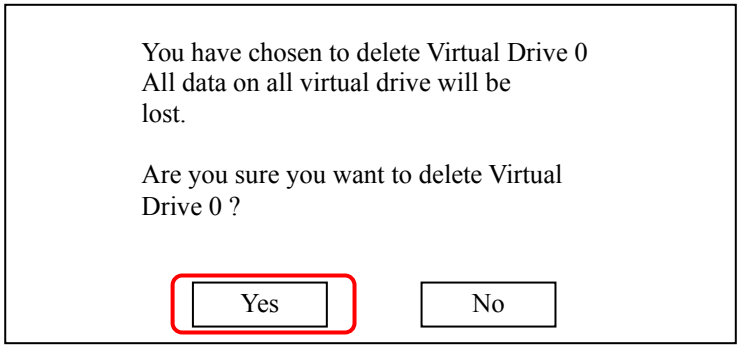

Figure B.2.6.1-9 Delete Virtual Disk Execution window

(13) When the virtual disk setting is completed, return to “Set Up ‘3.1 Procedure before New Installation’ (SETUP 03-0000)”, and perform the following procedures.

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B.2.6.2 Virtual disk setting procedure

When the virtual disk is already set up, this operation is not required.

(1) The virtual disk management window is displayed as shown in Figure B.2.6.2-1.
Select “Controller 0” by arrow keys, and press [F2] key.

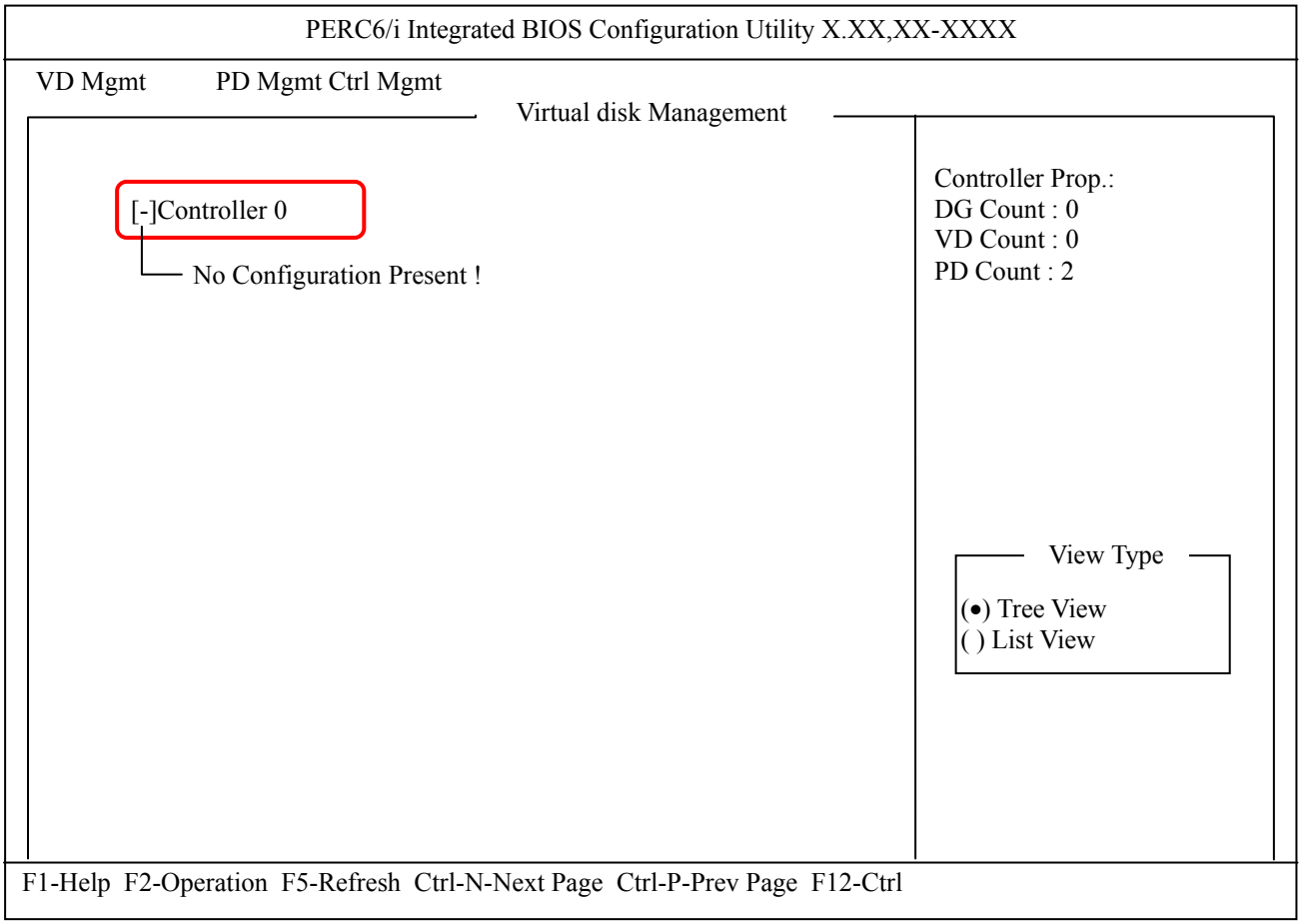

Figure B.2.6.2-1 Virtual Disk Management window

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(2) The controller action window is displayed as shown in Figure B.2.6.2-2.
Select “Create New VD” by arrow keys, and press [Enter] key.
If “Create New VD” is inactive and [Enter] key cannot be pressed, proceed to (a).

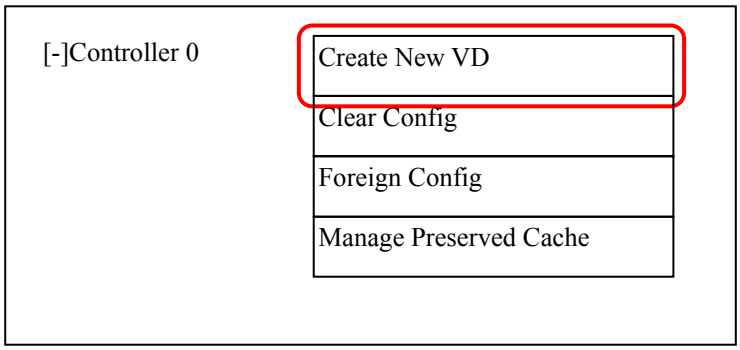

Figure B.2.6.2-2 Controller Action window 1

(a) Select “Foreign Config” by using arrow keys, and then press [Enter] key.
The “import” and “Clear” buttons are displayed. Select “Clear” button by using arrow keys, and then press [Enter] key.

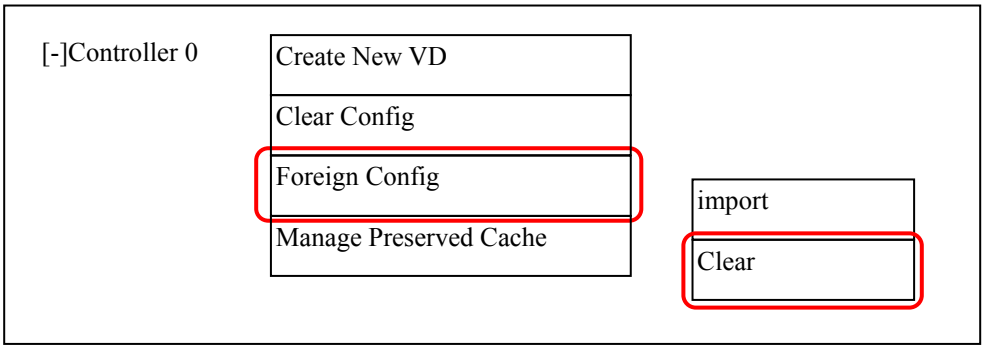

Figure B.2.6.2-2A Controller Action window 2

(b) The “Foreign Config” clear execution window is displayed. Select [OK] by using arrow keys.
Execute step (2) again.

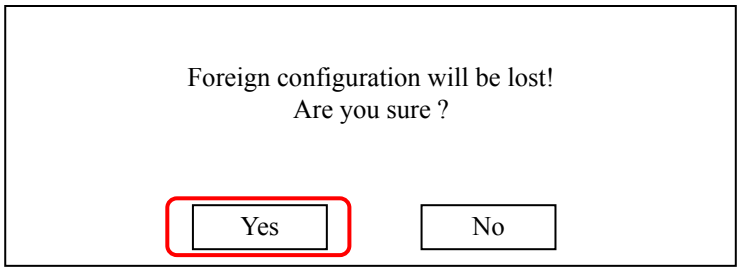

Figure B.2.6.2-2B Foreign Config Clear Execution window

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(3) The virtual disk setting window 1 is displayed as shown in Figure B.2.6.2-3.
The displayed contents are shown in Table B.2.6.2-1.

NOTE: In Figure B.2.6.2-3, if only one row is displayed for [Physical Disks], one HDD is not recognized.
Reboot the node by executing steps (19) and (20), and execute the procedures again beginning from step (2) of 'B.2.6.1 Virtual disk setting confirmation'.
If the HDD is still not recognized again, replace the internal HDD in reference to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual". When the display of [--:00:00] is shown in the [Drive ID] of the [Physical Disks], then replace the HDD in the hardware drive slot 1, and when the display of [--:00:01] is shown in it, then replace the HDD in the hardware drive slot 0.

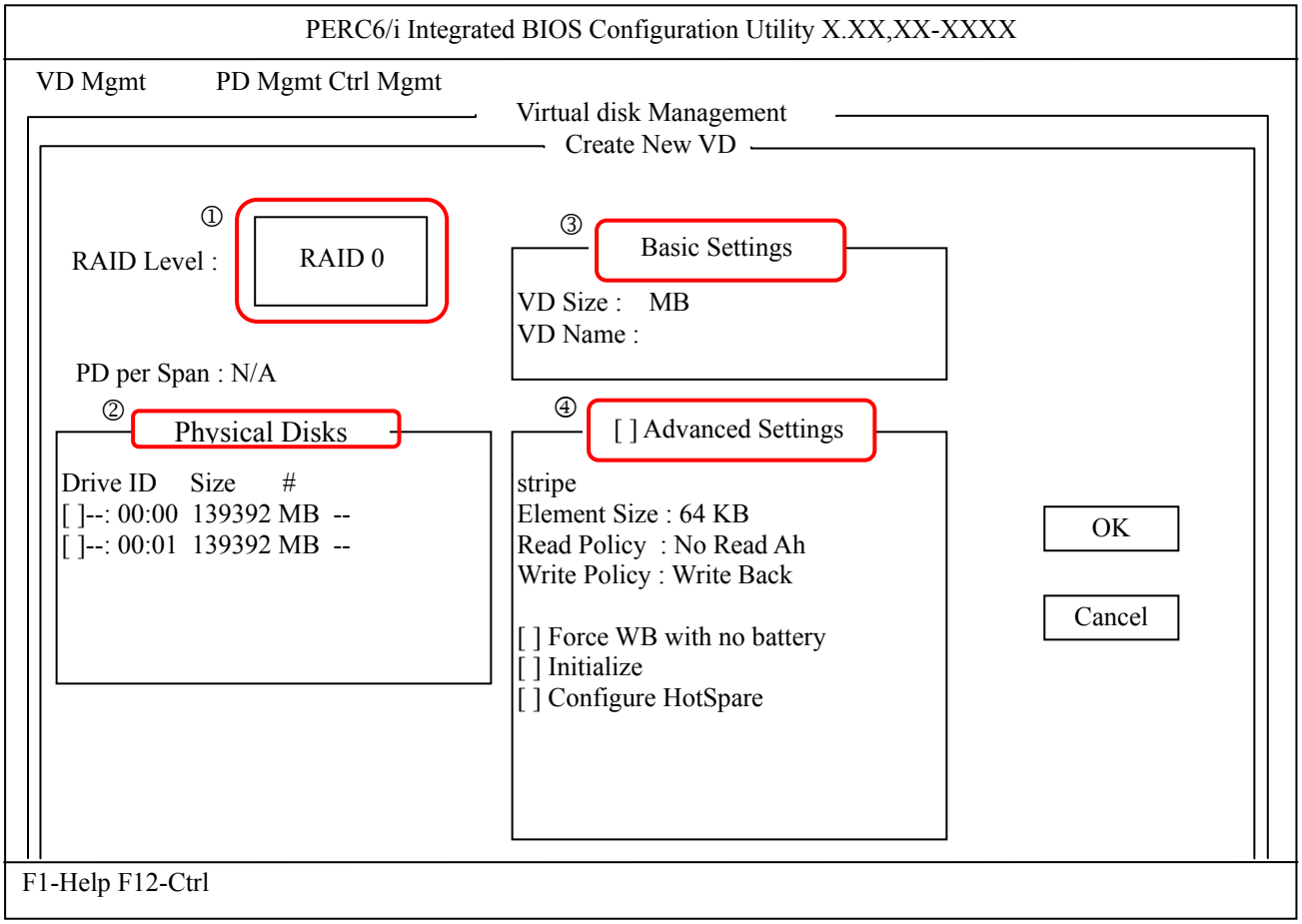

Figure B.2.6.2-3 Virtual Disk Setting window 1

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Table B.2.6.2-1 Virtual Disk Setting Displayed Contents

#	Displayed Contents	Setting Procedure Reference
①	RAID Level is displayed.	Refer to "B.2.6.2 Virtual Disk Setting Procedure (4)".
②	Physical Disk information is displayed.	Refer to 'B.2.6.2 Virtual Disk Setting Procedure (6)'.
③	The size and name of Virtual Disk are displayed.	Refer to 'B.2.6.2 Virtual Disk Setting Procedure (8)'.
④	The parameter of Virtual Disk is displayed.	Refer to 'B.2.6.2 Virtual Disk Setting Procedure (9)'.

(4) Select RAID0 in the virtual disk setting window 1 as shown in Figure B.2.6.2-3 by the arrow key, and press [Enter] key.
"RAID0" and "RAID1" are displayed as shown in Figure B.2.6.2-4 RAID Level Setting window 1. Select "RAID 1" by arrow keys, and press [Enter] key.

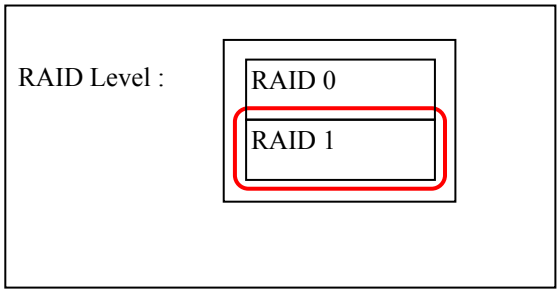

Figure B.2.6.2-4 RAID Level Setting window 1

(5) Check that RAID Level is RAID 1 as shown in Figure B.2.6.2-5 RAID Level Setting window 2.

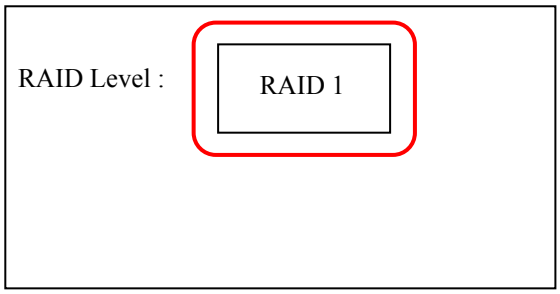

Figure B.2.6.2-5 RAID Level Setting window 2

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(6) Perform the physical disks setting in the virtual disk setting window 1 as shown in Figure B.2.6.2-3. As the physical disks are shown in Figure B.2.6.2-6 Physical Disk Setting window 1, select it by arrow keys, and press [Enter] key.
Execute this operation for two physical disks.

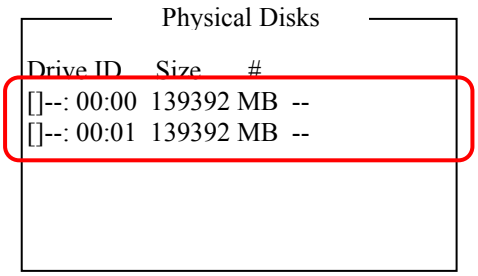

Figure B.2.6.2-6 Physical Disk Setting window 1

(7) Check that X is entered in [ ] and the number (00/01) is entered in # as shown in Figure B.2.6.2-7 Physical Disk Setting window 2.

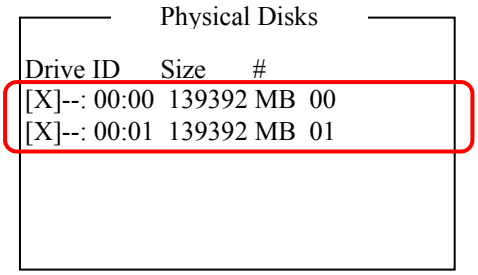

Figure B.2.6.2-7 Physical Disk Setting window 2

(8) Check “Basic Settings” in the virtual disk setting window 1 as shown in Figure B.2.6.2-3.
Check that VD Size is entered as shown in Figure B.2.6.2-8 Basic Settings window.

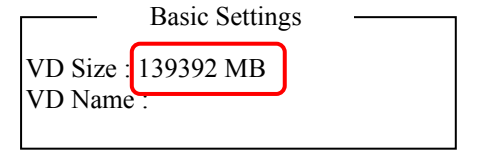

Figure B.2.6.2-8 Basic Settings window

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(9) Select "[ ] Advanced Settings" in the virtual disk setting window 1 as shown in Figure B.2.6.2-3 by arrow keys, and press [Enter] key.
Select "[ ] Initialize (virtual disk initialization)" in the advanced settings setting window 1 as shown in Figure B.2.6.2-9 by arrow keys, and press [Enter] key.

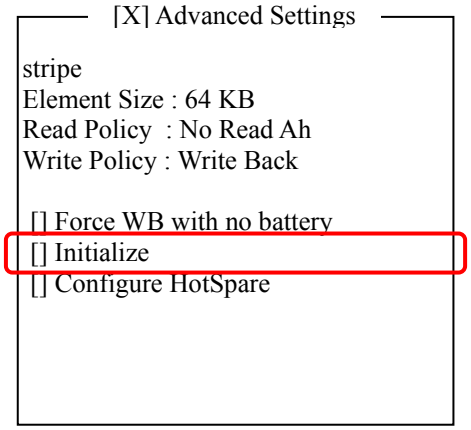

Figure B.2.6.2-9 Advanced Settings Setting window 1

(10) Check that "X" is entered in [ ] as shown in Figure B.2.6.2-10 Advanced Settings Setting window 2.

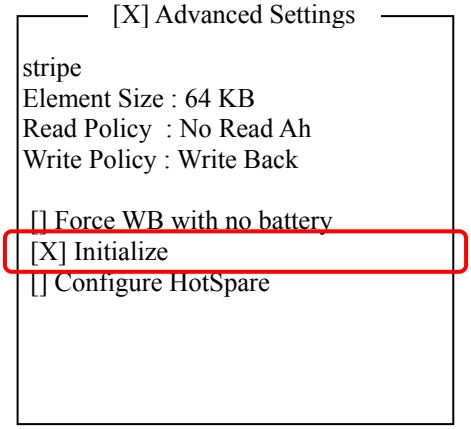

Figure B.2.6.2-10 Advanced Settings Setting window 2

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(11) The window result executed in step (4) to step (10) is shown in Figure B.2.6.2-11.
Check that it is shown as Figure B.2.6.2-11 Virtual Disk Setting window 2.
Table B.2.6.2-2 shows the contents of the setting confirmation.
After confirmed, select [OK] by arrow keys, and press [Enter] key. If it is incorrect, execute the procedure of the relevant positions in step (4) to step (10).

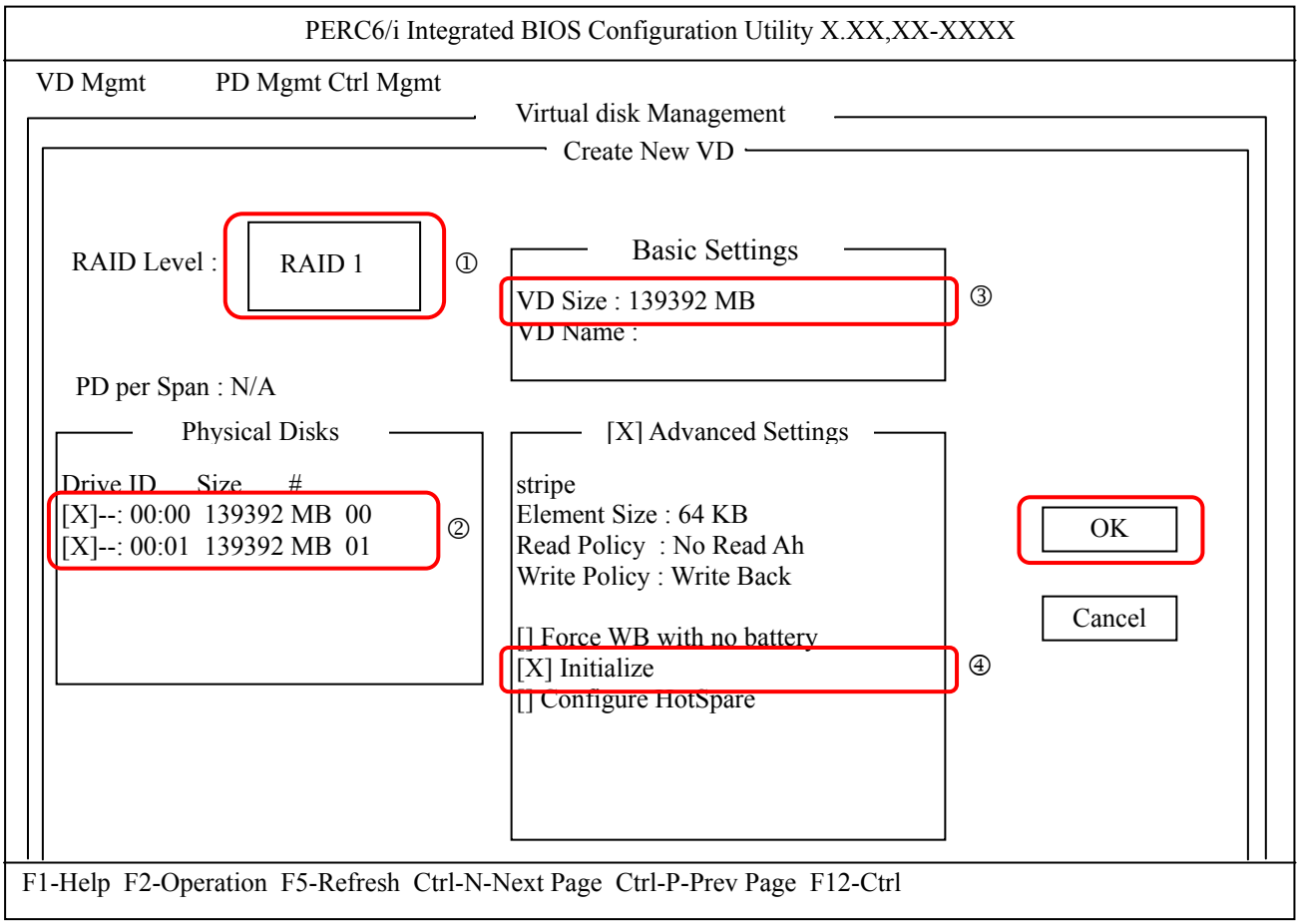

Figure B.2.6.2-11 Virtual Disk Setting window 2

Table B.2.6.2-2 Virtual Disk Setting Confirmed Contents

#	Confirmed Contents
①	Check that RAID Level is RAID 1.
②	Check that “X” is entered in [ ] and the number (00/01) is entered in # of Physical Disk.
③	Check the VD Size is entered.
④	Check that “X” is entered in [ ] of Initialize.

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(12) The virtual disk initialization processing start window is displayed as shown in Figure B.2.6.2-12.
Select [OK] by arrow keys and press [Enter] key.

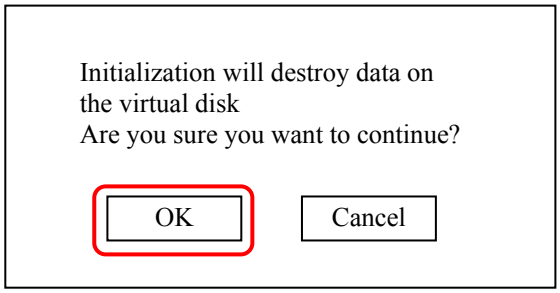

Figure B.2.6.2-12 Virtual Disk Initialization Processing Start window

(13) The virtual disk initialization processing completion window is displayed as shown in Figure B.2.6.2-13.
Select [OK] by arrow keys and press [Enter] key.

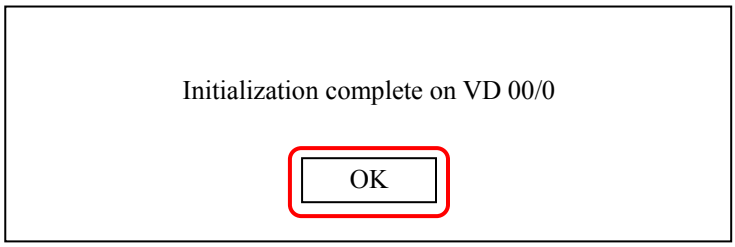

Figure B.2.6.2-13 Virtual Disk Initialization Processing Completion window

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(14) The virtual disk creation in progress is displayed as shown in Figure B.2.6.2-14.
The progress display and "Operation" are shown as Back Init display during the virtual disk creation.
When the progress display shows 100%, the virtual disk creation is completed.

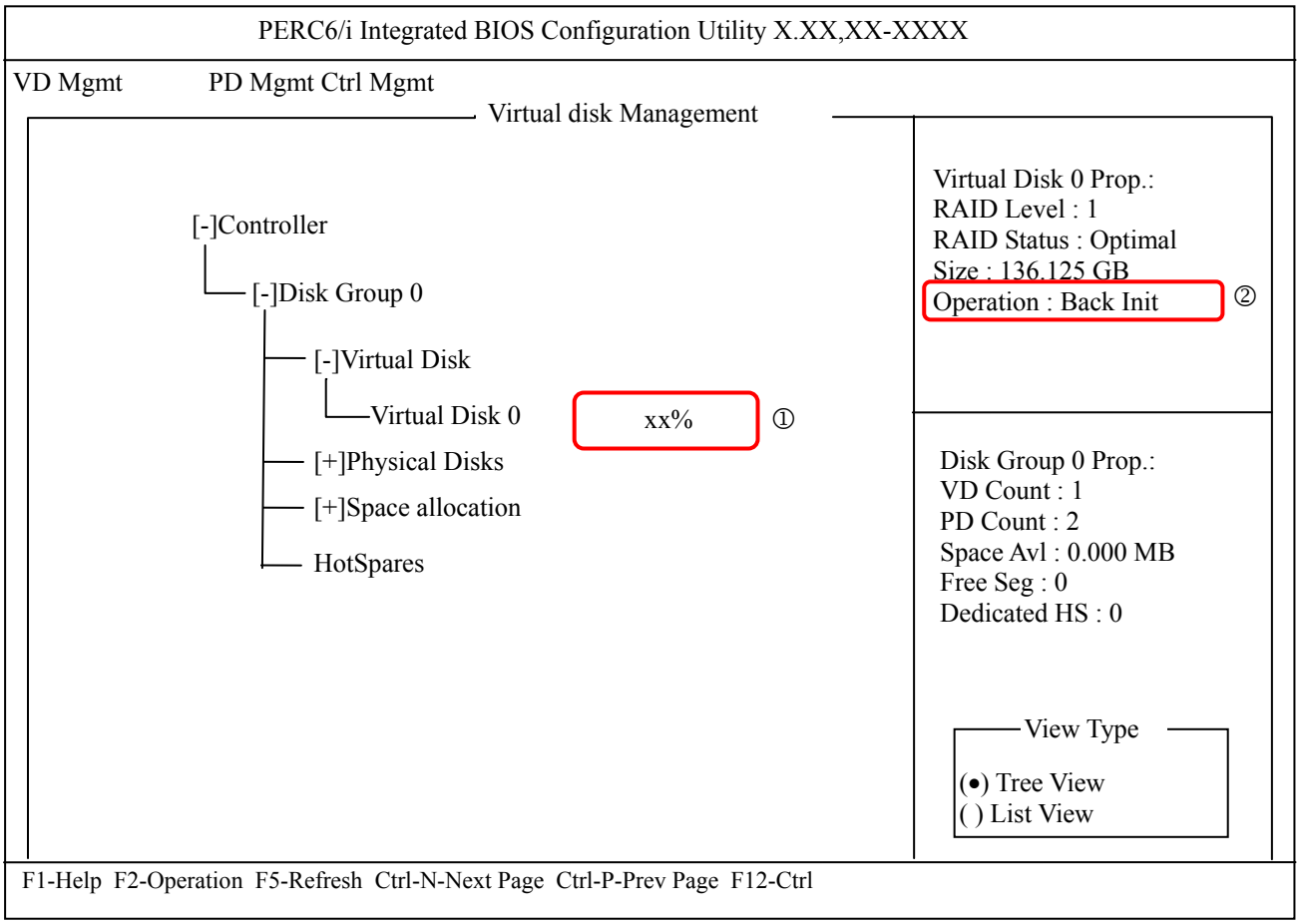

Figure B.2.6.2-14 Virtual Disk Creation in Progress

NOTE: The virtual disk creation takes about 20 minutes to be completed. In the meantime, do not perform other operations and wait until the creation is completed.

Table B.2.6.2-3 Displayed Contents of Virtual Disk Creation Progress

#	Displayed Contents
①	Progress display: Progress is displayed. When it shows 100%, the virtual disk creation is completed.
②	Operation: Back Init: During virtual disk creation

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(15) Figure B.2.6.2-15 shows the display after completing the virtual disk creation.
The progress display disappears after completing the creation, and “Operation” is displayed as None.

```
PERC6/i Integrated BIOS Configuration Utility X.XX,XX-XXXX
VD Mgmt        PD Mgmt Ctrl Mgmt
                    Virtual disk Management
                                                  Virtual Disk 0 Prop.:
                                                  RAID Level : 1
[-]Controller                                     RAID Status : Optimal
 └─ [-]Disk Group 0                               Size : 136.125 GB
     ├─[-]Virtual Disk                            Operation : None
     │   └─ Virtual Disk 0
     ├─[+]Physical Disks                          Disk Group 0 Prop.:
     ├─[+]Space allocation                        VD Count : 1
     └─HotSpares                                  PD Count : 2
                                                  Space Avl : 0.000 MB
                                                  Free Seg : 0
                                                  Dedicated HS : 0
                                                      View Type
                                                  (•) Tree View
                                                  ( ) List View
F1-Help  F2-Operation  F5-Refresh  Ctrl-N-Next Page  Ctrl-P-Prev Page  F12-Ctrl
```

Figure B.2.6.2-15 Display after Completing Virtual Disk Creation

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(16) Perform the virtual disk setting confirmation.
Select “Virtual Disk 0” by arrow keys, and press [F2] key.

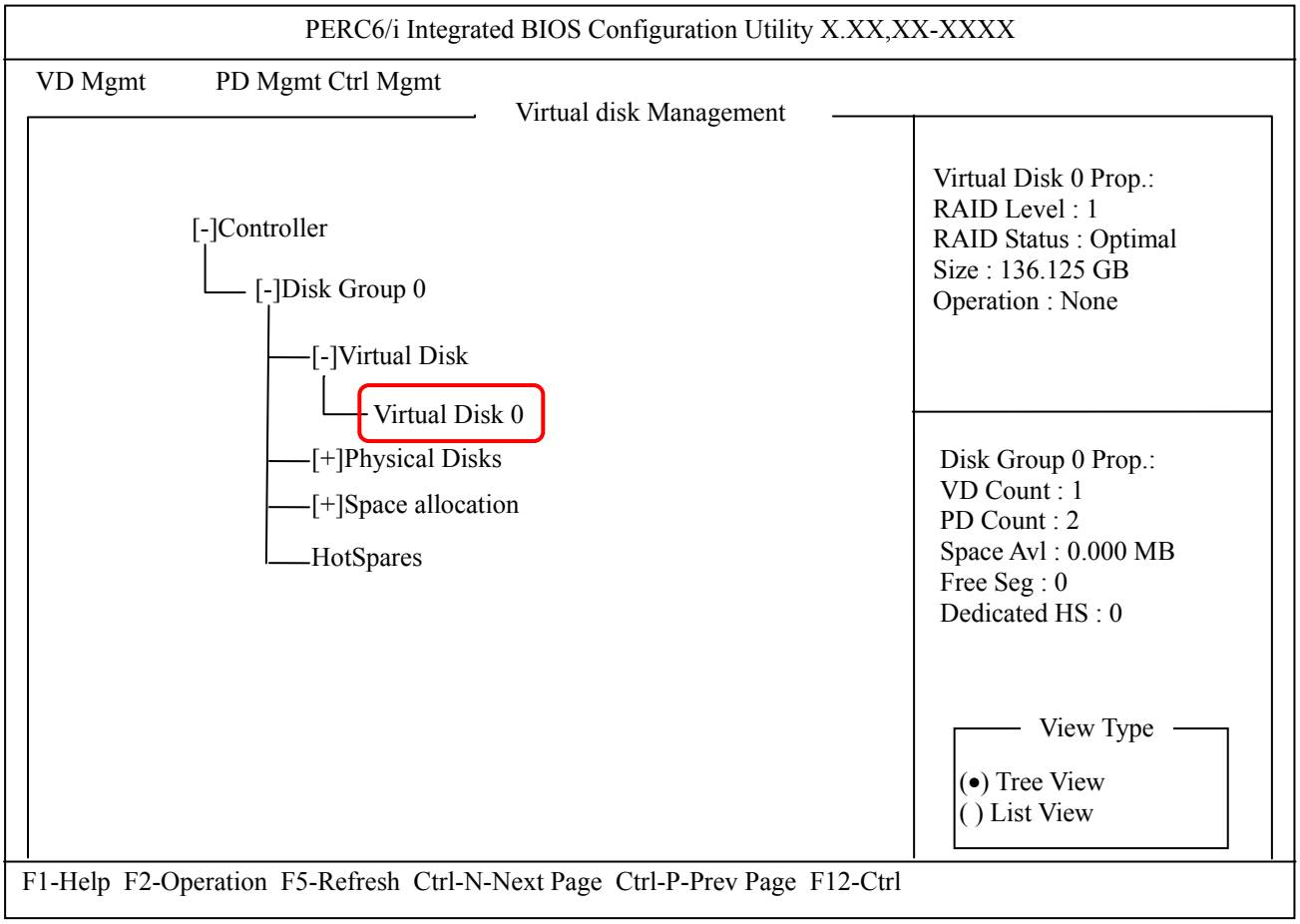

Figure B.2.6.2-16 Virtual Disk Management window

(17) The “Virtual Disk 0” action window is displayed as shown in Figure B.2.6.2-17.
Select “Properties” by arrow keys, and press [Enter] key.

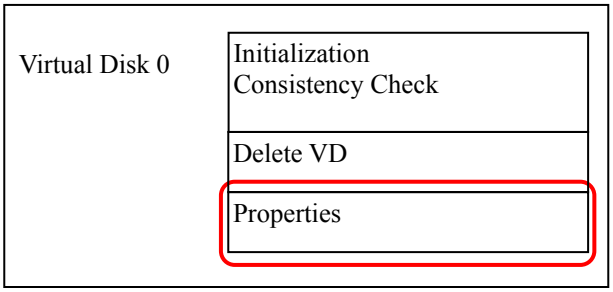

Figure B.2.6.2-17 Virtual Disk 0 Action window

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(18) Check that it is set as shown in the enclosed part of the "Virtual Disk 0" property window as shown in Figure B.2.6.2-18.

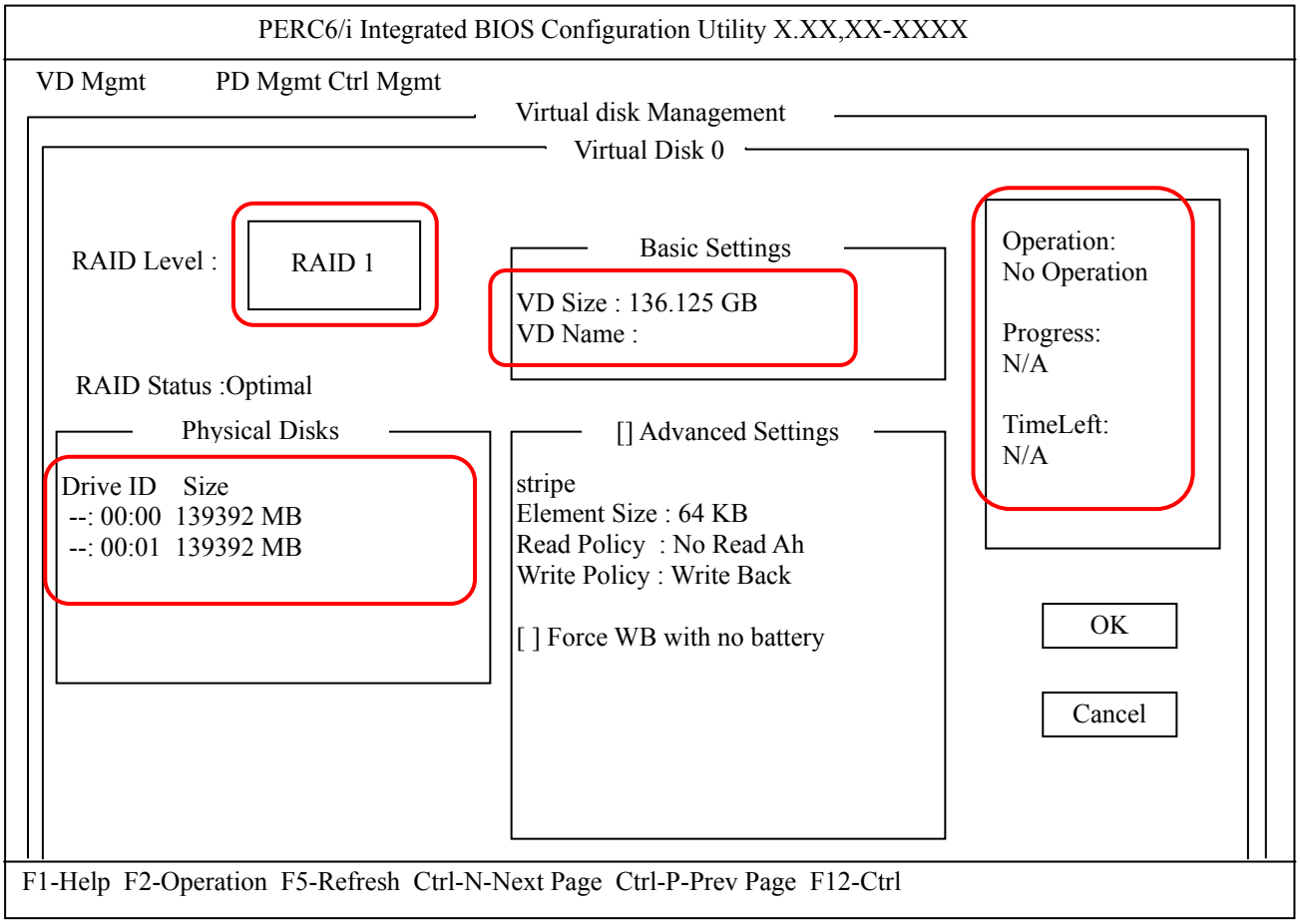

Figure B.2.6.2-18 Virtual Disk 0 Property window

If the setting is incorrect, refer to 'B.2.6.1 Virtual disk setting confirmation (12)', delete the virtual disk, and then execute from step (1) again.

When you can confirm that the setting is correct, press the [Esc] key and return to the Virtual Disk Management Window as shown in Figure B.2.6.2-16, and proceed to step (19).

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(19) Press [Esc] to terminate it.
The virtual disk termination window is displayed as shown in Figure B.2.6.2-19. Select [OK] by arrow keys, and press [Enter] key.

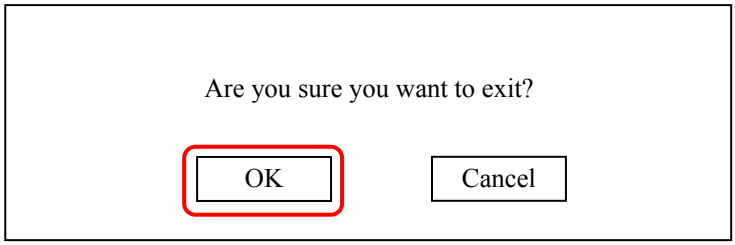

Figure B.2.6.2-19 Virtual Disk Termination window

(20) The node reboot execution window is displayed as shown in Figure B.2.6.2-20. Press [Ctrl] + [Alt] + [Delete] and reboot it.

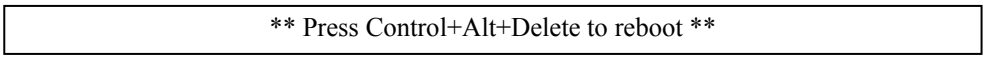

Figure B.2.6.2-20 node Reboot Execution window

(21) When the virtual disk setting is completed, return to "Set Up '3.1 Procedure before New Installation' (SETUP 03-0000)", and perform the following procedures.

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B.2.7 Confirmation of CPU Virtualization Support Mechanism

The confirmation of CPU virtualization support mechanism is not necessary when the target model is DELL.

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B.2.8 Virtual Drive Consistency Checking Procedure

The virtual drive consistency checking procedure is not necessary when the target model is DELL.

Return to the caller of the virtual drive consistency checking procedure and execute the rest of the operations.

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B.2.9 Other Setting/Confirmation Items

There is no item to set or confirm for DELL in this chapter.

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B.3 Maintenance CLI

B.3.1 Displaying the Hardware Status (hwstatus)

The hwstatus command displays the hardware status of the node.

B.3.1.1 Command line

The command line of the hwstatus command can use the following options.

hwstatus [-h]

Table B.3.1.1-1 shows the description of the options.

Table B.3.1.1-1 Command Options

No.	Option	Description	Remarks
1	-h	Displays the format of the command.	—

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B.3.1.2 Output format

The output format at the time of hwstatus command execution is shown in Figure B.3.1.2-1, and the contents of the output format are shown in Table B.3.1.2-1.

```
Output format of hwstatus

Model Information                                                                   1
 DELL Inc.    PowerEdge R710
SerialNumber Information                                                            2
 J8RMPBX
Fan Information                                                                     3
 0            ok                    -
 1            failed                -
(Repeat for the number of cooling fan unit)
Temperature Information                                                             4
 0            ok                    reading:33_(+/-_1)_degrees_C
(Repeat for the number of temperature sensor)
PowerSupply Information                                                             5
 0            ok                    -
 1            failed                -
Memory Information                                                                  6
 0            installed             locator:DIMM_XX,size:YYYY_MB
 1            not_installed         locator:DIMM_XX,size:-
(Repeat for the number of DIMMs)
MemoryTotal Information                                                             7
 0            -                     size: 5.5_GB(6.0_GB)
InternalHDD Information                                                             8
 0            ok                    size:XXX.XXX_GB,raid_level:RAID1,media_error:0,predictive_failure:0
 1            failed                size:XXX.XXX_GB,raid_level:RAID1,media_error:0,predictive_failure:0
InternalRAIDBattery Information                                                     9
 0            ok                    state_of_charge:100_%
BMC Information                                                                     10
 status       ok
 connection   ok
Network Interface                                                                   11
 mng0         up                    linkspeed: XXXXBase,mediatype:Copper,Management port
 hb0          down                  linkspeed: XXXXBase,mediatype:Copper,Heartbeat port
 (Repeat for the number of port names)
FC Port Information                                                                 11
 fcXXXX       up      wwpn: xxxxxxxxxxxxxxxx, linkspeed:8_Gbit
 fcXXXX       up      wwpn: xxxxxxxxxxxxxxxx, linkspeed:8_Gbit
(Repeat for the number of port names)
```

Figure B.3.1.2-1 hwstatus Output Format

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Table B.3.1.2-1 Contents of Output Format (1/3)

No.	Item	Description	Remarks
1	Model Information		(*7)
	DELL Inc.	Displays the name of manufacturer.	DELL Inc.
	PowerEdge R710	Displays the name of a product. The product name is shown after the manufacturer.	PowerEdge R710
2	Serial Number Information		(*7)
	XXXXXXXXXX	Displays the serial number of a model.	—
3	Fan Information		
	0, 1, •••	Displays the sequential serial numbers of cooling fan unit.	0 to 4
	ok, failed	Displays the availability of failures of cooling fan unit. (*1)	ok : Normal status failed : Abnormal status Usually everything is “ok”.
	-	Displays the vendor's unique information acquired by the hardware.	Usually displays a hyphen.
4	Temperature Information		
	0, 1, •••	Displays the sequential system thermometer of serial numbers.	0
	ok, failed	Displays the status of the system temperature. (*1)	ok : Normal status failed : Abnormal status Usually everything is “ok”.
	reading: 33_(+/-_1)_degrees_C	Displays the vendor’s unique information acquired by the hardware.	The format depends on the vendor. (*2)
5	Power Supply Information		
	0, 1	Displays the sequential serial numbers of the power supply unit.	0 to 1 : In the case of cluster configuration 0 : In the case of single node configuration
	ok, failed, not_installed	Displays the availability of power supply unit failures. (*1)	ok : Normal status failed : Abnormal status not_installed : Not installed
	-	Displays the vendor’s unique information acquired by the hardware.	Usually displays a hyphen.
6	Memory Information		(*8)
	0, 1, •••	Displays the sequential serial numbers of Memories. (*5)	0 to 17
	ok, installed, not_installed	Displays the information of DIMM. (*1)	ok : Installed installed : Installed not_installed : Not installed
	locator:DIMM_XX, size:YYYY_MB	Displays the vendor’s unique information acquired by the hardware.	The format depends on the vendor. (*2)

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Table B.3.1.2-1 Contents of Output Format (2/3)

No.	Item	Description	Remarks
7	MemoryTotal Information		(*9)
	0	Displays the total number of Memory sequentially.	0
	-	Displays "-". (*9)	—
	size: xx_GB(yy_GB)	Displays the vendor's unique information acquired by the hardware.	Displays the total number of Memory in GB. By the configuration of the system, the total number of memory may display smaller than the installed memory that is displayed in the parentheses. (*2)
8	Internal HDD Information		
	0, 1	Displays the sequential serial numbers of Internal HDD.	0 to 1 : In the cluster configuration 0 to 5 : In the single node configuration
	ok, rebuild, failed, not_supported	Displays the embedded HDD status. (*1)	ok : Normal status rebuild : RAID is being rebuilt failed : A hardware failure was detected in the disk. Some disks have failures or do not exist. not_supported: information cannot be get due to no installation of MegaCLI.
	size:XXX.XXX_GB, raid_level:RAID1, media_error:X,predictive_failure:X	Displays the vendor's unique information acquired by the hardware.	The format is vendor dependent. (*2) media_error:X is "1" in the case that the media error count has exceeded the threshold value. And X is "0" in the case that the media error count has been under the threshold value. A hyphen is displayed in case of an information acquisition failure. predictive_failure:X is "1" in the case that S.M.A.R.T. warnings has exceeded the threshold. And X is "0" in the case that S.M.A.R.T. warnings has been under the threshold. A hyphen is displayed in case of an information acquisition failure. (*11)
9	InternalRAIDBattery Information		
	0, 1, •••	Displays the sequential serial number of Internal RAIDBattery.	—
	ok, failed,charging, not_supported	Displays the charge status of the RAID battery. (*1)	—
	state_of_charge:XX_%	Displays the vendor's unique information acquired by the hardware.	—
10	BMC Information		
	status ok, status Unknown!	Displays this side node BMC status.	ok : Normal status Unknown! : Information
	connection ok, connection failed, connection none	Displays the other side node BMC connection status.	(*6) ok : Normal status failed : Communication with BMC of the other side node fails. none : Cluster is not built

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Table B.3.1.2-1 Contents of Output Format (3/3)

No.	Item	Description	Remarks
11	Network Interface		
	mng0, hb0, pm0, pm1, ethX, •••	Displays the port name. (*3) (*4)	mng0 : Management port hb0 : Heartbeat port (*6) pmX : Maintenance port ethX : Data port (1GbE) * X indicates an integer more than or equal to 0. Example: pm0, eth1
	up, down	Displays the port status. (*3) (*4)	up : LinkUp down : LinkDown * The port not connecting the cable displays “down”. (*5)
	linkspeed: XXXXBase, linkspeed: Unknown!	Displays the link speed. (*4)	10Base : 10Mbps 100Base : 100Mbps 1000Base : 1Gbps Unknown! : Link speed is unknown
	mediatype:Copper	Displays the media type. (*3) (*4)	Copper : Copper wire
	Management port, Heartbeat port, Private maintenance port	Displays the use. (*4)	Management port : In case the port name is “mng0” Heartbeat port : In case the port name is “hb0” Private Maintenance port : In case the port name is “pm0, pm1” * The use is not displayed for other ports.
12	FC Port Information (*10)		
	fcXXXX, …	Displays the Fibre Channel port name in ascending order. (*1)	X represents an integer greater than or equal to 0. (Hexadecimal)
	up, down	Displays the port status. (*1)	up : LinkUp down : LinkDown
	wwpn: xxxxxxxxxxxxxxxx	Displays the host port WWN. (*1)	—
	linkspeed:8_Gbit	Displays the link speed. (*1)	1_Gbit : 1Gbps 2_Gblt : 2Gbps 4_Gbit : 4Gbps 8_Gbit : 8Gbps 10_Gbit : 10Gbps 16_Gbit : 16Gbps Unknown! : Displayed during LinkDown or for link speeds that are not supported

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*1: In case of an information acquisition failure, a hyphen is displayed. Note that, even in case of an information acquisition failure, the information already acquired is displayed.
*2: When the vendor's unique information does not exist, a hyphen is displayed.
*3: When the acquisition of the statuses of all pots failed, the Network Interface information is displayed in only one row. In this case, a hyphen is displayed for the port name, the port status, and the media type.
*4: When the acquisition of the status in units of ports fails, the information of the port which failed the acquisition is not displayed.
*5: Unused (unset) data port also displays "down". In this case, check if "(Not used)" is displayed just after the name of interface, by using iflist –v command. To execute this operation, refer to "Maintenance Tool '2.4 Displaying the Network Status (iflist)' (MNTT 02-0200)".
*6: Not displayed in the case of single node configuration.
*7: OS version is displayed with the 2.2.1-XX or above. For the confirmation of OS version, refer to "Maintenance Tool '2.34 Displaying the Version of the OS (versionlist)' (MNTT 02-2060)".
*8: "installed/not_installed" is displayed on the 3.0.0-XX or above OS version, and "ok/not_installed" is displayed on the 3.0.0-XX or earlier OS version. For the confirmation of the OS version, refer to "Maintenance Tool '2.34 Displaying the Version of the OS (versionlist)' (MNTT 02-2060)".
*9: The OS version is displayed with the 3.0.0-XX or later version. For the confirmation of the OS version, refer to "Maintenance Tool '2.34 Displaying the Version of the OS (versionlist)' (MNTT 02-2060)".
*10: Nothing is shown on the OS version 5.1.0-XX or earlier. For the confirmation of the OS version, refer to "Maintenance Tool '2.34 Displaying the Version of the OS (versionlist)' (MNTT 02-2060)".
*11: "media_error" and "predictive_failure" is displayed on the OS version 5.2.0-XX or later. For checking the OS version, refer to "Maintenance Tool '2.34 Displaying the Version of the OS (versionlist)' (MNTT 02-2060)".

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B.3.1.3 Execution procedure

This subsection describes the procedure for executing the hwstatus command.

(1) At the time of maintenance, log in to the execution node via ssh from the maintenance PC usually. For the login method, refer to "Maintenance Tool '1.3 Procedures for Operating Commands' (MNTT 01-0200)".

(2) Execute the hwstatus command by each node. Figure B.3.1.3-1 shows display examples at the time of hwstatus execution.
If the hwstatus command terminated abnormally, the hardware status is not displayed, and the message ID is displayed. In this case, refer to 'B.3.1.4 Command termination messages and action to be taken', and take actions.

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```
$ sudo hwstatus
Model Information
 DELL Inc.      PowerEdge R710
SerialNumber Information
 CTVHRBX
Fan Information
 0              ok              -
 1              ok              -
 2              ok              -
 3              ok              -
 4              ok              -
 5              ok              -
Temperature Information
 0              ok              reading:43_(+/-_0.500)_degrees_C
PowerSupply Information
 0              ok              -
 1              ok              -
Memory Information
 0              ok              locator:DIMM_A1,size:2048_MB
 1              ok              locator:DIMM_A2,size:2048_MB
 2              ok              locator:DIMM_A3,size:2048_MB
 3              not_installed   locator:DIMM_A4,size:-
 4              not_installed   locator:DIMM_A5,size:-
 5              not_installed   locator:DIMM_A6,size:-
 6              not_installed   locator:DIMM_A7,size:-
 7              not_installed   locator:DIMM_A8,size:-
 8              not_installed   locator:DIMM_A9,size:-
 9              ok              locator:DIMM_B1,size:2048_MB
 10             ok              locator:DIMM_B2,size:2048_MB
 11             ok              locator:DIMM_B3,size:2048_MB
 12             not_installed   locator:DIMM_B4,size:-
 13             not_installed   locator:DIMM_B5,size:-
 14             not_installed   locator:DIMM_B6,size:-
 15             not_installed   locator:DIMM_B7,size:-
 16             not_installed   locator:DIMM_B8,size:-
 17             not_installed   locator:DIMM_B9,size:-
MemoryTotal Information
 0              -               size: 11.5_GB(12.0_GB)
InternalHDD Information
 0              ok              size:136.732_GB,raid_level:RAID1,media_error:0,predictive_failure:0
 1              ok              size:136.732_GB,raid_level:RAID1,media_error:0,predictive_failure:0
InternalRAIDBattery Information
 0              ok              state_of_charge:100_%
BMC Information
 status         ok
 connection     ok
Network Interface
 mng0           up              linkspeed: 1000Base,mediatype:Copper,Management port
 hb0            up              linkspeed: 1000Base,mediatype:Copper,Heartbeat port
 eth0           up              linkspeed: 1000Base,mediatype:Copper
 eth1           down            linkspeed: Unknown!,mediatype:Copper
 eth2           down            linkspeed: Unknown!,mediatype:Copper
 eth3           down            linkspeed: Unknown!,mediatype:Copper
 pm0            up              linkspeed: 1000Base,mediatype:Copper,Private Maintenance port
 pm1            down            linkspeed: Unknown!,mediatype:Copper,Private Maintenance port
```

Figure B.3.1.3-1 Display Examples at the time of hwstatus Execution

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B.3.1.4 Command termination messages and action to be taken

A message may be displayed when the hwstatus command is executed. Actions to be taken against messages are described in Table B.3.1.4-1 “Message IDs and Actions to be Taken”.

Table B.3.1.4-1 Message IDs and Actions to be Taken

No.	Message ID	Message	Description	Action
1	KAQM14131-E	A syntax error exists in the parameter (<*parameter*>).	The parameter has an error.	Specify the correct parameter, and execute it again.
2	KAQM14134-E	An error occurred in the shared processing of commands. (Error = <*error*>)	An error occurred in the common processing of the command.	Collect the OS log, and send it to the support center. To collect the OS log, refer to “Maintenance Tool ‘2.19 Collecting Logs (oslogget)’ (MNTT 02-1300)”.
3	KAQM14136-I	Usage: <*command-syntax*>	The command format is output.	Not required to be corresponding. Displayed when the –h option is specified. Also displayed continuously when KAQM14131-E is displayed.
4	KAQM14138-E	There are too many or too few parameters.	The parameter has excess or deficiency.	After confirming the format of the command, specify the correct parameter, and execute it again.
5	KAQM14150-E	An error occurred in the system.	An error occurred in the system.	Collect the OS log, and send it to the support center. To collect the OS log, refer to “Maintenance Tool ‘2.19 Collecting Logs (oslogget)’ (MNTT 02-1300)”.
6	KAQM14167-W	MegaCLI, which is required to acquire internal hard disk and battery information, is not installed.	Necessary commands to get the information of the built-in disks and batteries are not installed.	Execute again, by installing necessary commands to get the information of the built-in disks and batteries.

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CONTENTS

B.4 Setting Value when the OS is Installed

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B.4 Setting Value when the OS is Installed

The following shows the setting value that is required when installing OS.
After confirming the following table, return to the status before coming to this operation.

Table B.4-1 Setting value when the OS is installed

Item	Setting value
Configuration	If the two internal HDDs are installed in the node, it is cluster configuration. If the six internal HDDs are installed in the node, it is single node configuration.
RAID rebuilding necessity	Execute rebuilding (*)

*: This is unnecessary when the display whether to rebuild the RAID is not displayed on the screen while installing OS.

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CONTENTS

B.5 Disk Setting

B.5.1 Acquiring WWNs of Nodes

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B.5 Disk Setting

B.5.1 Acquiring WWNs of Nodes

Acquire a WWN of node that is set to HBA BIOS from the KVM console.

This process must be done in each node with switching the console.

For the KVM connection, refer to "Set Up '1.2 Confirmation of KVM Connection' (SETUP 01-0010)".

(1) Execute (a) when OS is stopped, and execute (b) when OS is running.

(a) Startup the OS by refer to "Installation '2.1.1 Procedure for turning on the power' (INST 02-0000)".

(b) Reboot the OS by refer to "Installation '2.1.3 Procedure for rebooting the OS' (INST 02-0100)".

(2) If the following message is displayed while starting up the OS, press [E] key with keep pressing of [Alt] key or [Ctrl] key to display the Emulex Utility window.

```
<Message>
  Press < Alt-E> or <Ctrl-E> to enter Emulex BIOS Configuration utility.
  Press< s > to skip Emulex BIOS
```

(3) Input the port number (1-2) to be acquired WWN in the "Enter a Selection:" on Figure B.5.1-1, then press [Enter] key.
If WWN for all of the installed ports is completed its acquiring, press [x] key and proceed to (5).

NOTE: Figure B.5.1-1 shows an example of the input window when the port number "1" is selected.

```
        Emulex Light Pulse BIOS Utility, ZB2.02a2
        Copyright (c) 1997-2007 Emulex. All rights reserved.

        Emulex Adapters in the System:

1. LPe11002-M4:     PCI Bus, Device, Function (02, 00, 00)
2. LPe11002-M4:     PCI Bus, Device, Function (02, 00, 01)




Enter a Selection: 1

Enter <x> to Exit
```

Figure B.5.1-1 Emulex Utility window when one HBA with 2 Ports are installed (Example)

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(4) Take a note of WWN (16-digit alphanumeric characters) displayed at "Port Name:" in Figure B.5.1-2 in the worksheet for a memo of WWN as shown in Table B.5.1-1, and then press [Esc] key to return to the previous window.

```
Adapter 01:          PCI Bus, Device, Function (02, 00, 00)

LPe11002-M4:   I/O Base:2000     Firmware Version: ZS2.72A2
Port Name: 10000000 C988752A     Node Name: 20000000 C988752A
Topology: Auto Topology : Loop First (Default)
The BIOS of this Adapter is Disable

1.  Configure Boot Devices
2.  Configure This Adapter's Parameters



Enter a Selection:

Enter <x> to Exit          <d> to Default Values          <Esc> to Previous Menu
```

Figure B.5.1-2 Emulex Utility port window (Example)when 1 HBA with 2 Ports are Mounted

NOTE: The column in Table B.5.1-1 is listed from the left in the order of "1." and "2." in Figure B.5.1-1.

Table B.5.1-1 Example of Writing Worksheet for Memo of WWN when the port number of node 0 is "1".

	PCI Bus, Device, Function (02, 00, 00)	PCI Bus, Device, Function (02, 00, 01)
node0	10000000 C988752A	
node1		

(5) Execute (3) to (4) to the number of installed ports.

(6) Enter "Y" to the message of "REBOOT THE SYSTEM (Y/N);" in Figure B.5.1-3.

```
Reboot the System to make All the Changes to Take Effect!

REBOOT THE SYSTEM (Y/N);
```

Figure B.5.1-3 Reboot message

(7) Node is rebooted automatically when entering "Y".

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CONTENTS

C.1 Local Initial Operations According to Maintenance Request

C.1.1 When Detected by HiTrack

C.1.2 When Detected by SNMP Trap

C.1.3 When the System Administrator Noticed a Failure

C.1.3.1 Action to be taken in the cluster configuration

C.1.3.2 Action to be taken in the single node configuration

C.1.4 When the Maintenance Personnel Noticed the Failure at the Time of Initial Installation in the Local Site

C.1.5 Determination Procedure for the Possible Failure Part when a PCI Error Occurred

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C.1 Local Initial Operations According to Maintenance Request

The contents of local initial operations according to the maintenance request when a failure occurs in Hitachi Data Ingestor are described.

C.1.1 When Detected by HiTrack

A failure detected by HiTrack is reported to the Maintenance Center of (HDS) by HiTrack. The maintenance personnel should perform the failure analysis according to the following.

(1) Receive the failure information acquired by HiTrack from the Maintenance Center of (HDS) via FTP or e-mail.

(2) Acquire TagID and SIM from the received failure information.
The acquired TagID is used in the failure analysis to specify the failure occurrence node and to replace the parts. The acquired SIM is used in the failure analysis to analyze the failure of Hitachi Data Ingestor.

NOTE: The acquired SIM is the one when the failure occurred or when the communication with the node was disrupted.
Maintenance personnel need to confirm the SIM by connecting the maintenance PC even at the local site.

(3) Based on the acquired TagID and SIM, perform the failure analysis and failure determination operation.
For the details of the failure analysis and failure determination operation, refer to 'C.2.2 Determination Procedure when a Failure Occurred'.

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C.1.2 When Detected by SNMP Trap

When monitoring by SNMP, a failure detected by HDI is stored in the SNMP Trap server as a failure information equivalent to SIM and reported to the SNMP manager. After that, it is reported to the Maintenance Center of (HDS) by the system administrator. The maintenance personnel should perform the local initial measurement and failure analysis according to the following.

(1) By requesting the system administrator, receive all the SNMP Trap. Maintenance personnel should check the Trap IDs and Trap messages in the received SNMP Trap, and check whether there is a Trap where the SIM of HDI is stored or not. For the details of SNMP Trap where the SIM of HDI is stored, refer to "Troubleshooting '7.2 Messages of Trap that the Maintenance Personnel should Obtain Table 7.2-1 SNMP Trap sent by HDI' (TRBL 07-0010)".

(2) Based on the management IP address (IP address of the port used in the operation in the single node configuration) of the received failure information, confirm the position of the node where a failure occurred with the system administrator. The confirmed position of the node where a failure occurred is used in the failure analysis for specifying the failure occurrence location and for replacing.
In the single node configuration, the system administrator should execute the failure determination that is described in 'C.1.3 When the System Administrator Noticed a Failure' in advance.

(3) Based on the collected failure information, perform the failure analysis and failure determination operation. For the details of the failure analysis and failure determination operation, refer to 'C.2.2 Determination Procedure when a Failure Occurred'.

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C.1.3 When the System Administrator Noticed a Failure

When the system administrator detected a failure, it is reported to the Maintenance Center of (HDS) by the system administrator. The maintenance personnel should perform the local initial measurement and failure analysis according to the following.
In the single node configuration, the system administrator should determine a failure in advance to make shorten of downtime.
Refer to "C.1.3.1 Action to be taken in the cluster configuration" for the cluster configuration and "C.1.3.2 Action to be taken in the single node configuration' for the single node configuration.

C.1.3.1 Action to be taken in the cluster configuration

(1) When the failure noticed by the system administrator is the LCD display of the node, LCD display of the parts (power unit, embedded HDD and others) or LED alarm lighting of the parts

① Request the system administrator to check the display of MAINTENANCE lamp and LED alarm lighting of the installed parts.

② The confirmed information is used in the failure analysis.

③ Based on the collected failure information, perform the failure analysis and failure determination operation. For the details of the failure analysis and failure determination operation, refer to 'C.2.2 Determination Procedure when a Failure Occurred'.

(2) When the failure noticed by the system administrator is the abnormal OS operation and inaccessible
Request the system administrator if he/she can access the both node with HFSM, and if it can be accessed, check whether failover has occurred or not.

- Proceed to (2-1) if the system administrator cannot access the both nodes with HFSM.
- When the failover has occurred, proceed to step (2-2).
- When the failover has not occurred, proceed to step (2-3).

(2-1) When it cannot access the both nodes with HFSM

① Remove the LAN cable connected to the #7 port on the management LAN IP-SW, and connect the removed LAN cable to the #9 port on the management LAN IP-SW. Request the system administrator to check whether it can communicate with the both nodes with HFSM.
When it is available to communicate, execute the step② to step⑤. When it is not available to communicate, reconnect the removed LAN cable to the port as it was connected, and execute the step⑥.

② Because it is the port failure of the maintenance LAN IP-SW, ask the system administrator to failover the resource group. If the system administrator is not available to operate, maintenance personnel should perform this operation with the permission of the system administrator. Ask the system administrator which node should be used to failover the resource group. If no instruction is given, failover the resource group on the node 1 to the node 0. For the failover procedure, refer to "Maintenance Tool '3.1 Failover Node Termination to Execute the OS stop or OS reboot' (MNTT 03-0000)".

③ Remove the #3 port on the maintenance LAN IP-SW that is connected with the management port on the side of node1, and remove the LAN cable that is connected with the management port on the side of node0.

④ Connect the LAN cable that is removed from #3 on the maintenance LAN IP-SW at the step③ to the management port on the side of node0.

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⑤ Replace the management LAN IP-SW. For the replacement of management LAN IP-SW, refer to "Replacement '1.6 Replacing the Management LAN IP-SW (IP Switch) (1) Replacement procedure while the node is in operation' (REP 01-0290)".
After replacing the management LAN IP-SW, execute the operation described in "Troubleshooting '9.1.2 Confirmation of Recovery from Hardware Failure' (TRBL 09-0010)".

⑥ Request the system administrator to replace the LAN cable that is connected between the HFSM and the management LAN IP-SW, and check if the connection can communicate or not.
If it cannot communicate, it is a failure of the management server. Therefore, request the system administrator to review and replace the management server.

(2-2) When failover has occurred

① Request the system administrator to check SIM. The confirmed SIM is used in the failure analysis.

② Based on the collected failure information, perform the failure analysis and failure determination operation. For the details of the failure analysis and failure determination operation, refer to 'C.2.2 Determination Procedure when a Failure Occurred'.

(2-3) When failover has not occurred

① The system administrator may have performed the incorrect setting. Request the system administrator to recheck the items before and after the setting if there are any errors or not.

② Request the system administrator to acquire the failure information.

③ Execute the manual dump operation. Furthermore, inform the Technical Support Center of the manual dump execution.

④ Send the acquired failure information to the Technical Support Center via e-mail.

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C.1.3.2 Action to be taken in the single node configuration

(1) In the single node configuration, maintenance personnel get the result of failure determination operation from the system administrator, and execute the action to be taken according to the result. Figure C.1.3.2-1 shows the overview of the determination flow to be executed by the system administrator.

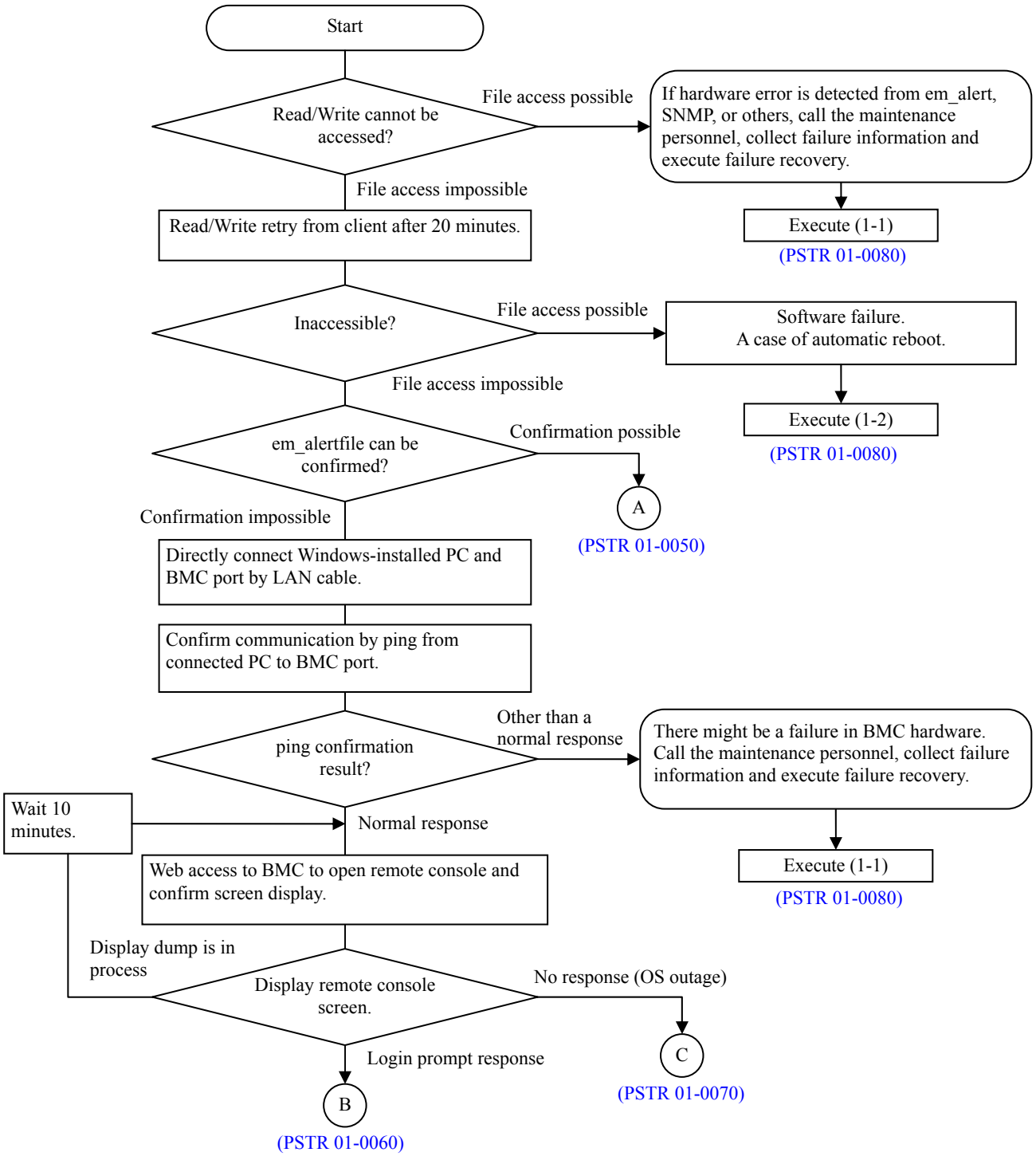

Figure C.1.3.2-1 Overview of Determination Flow by System Administrator (1/4)

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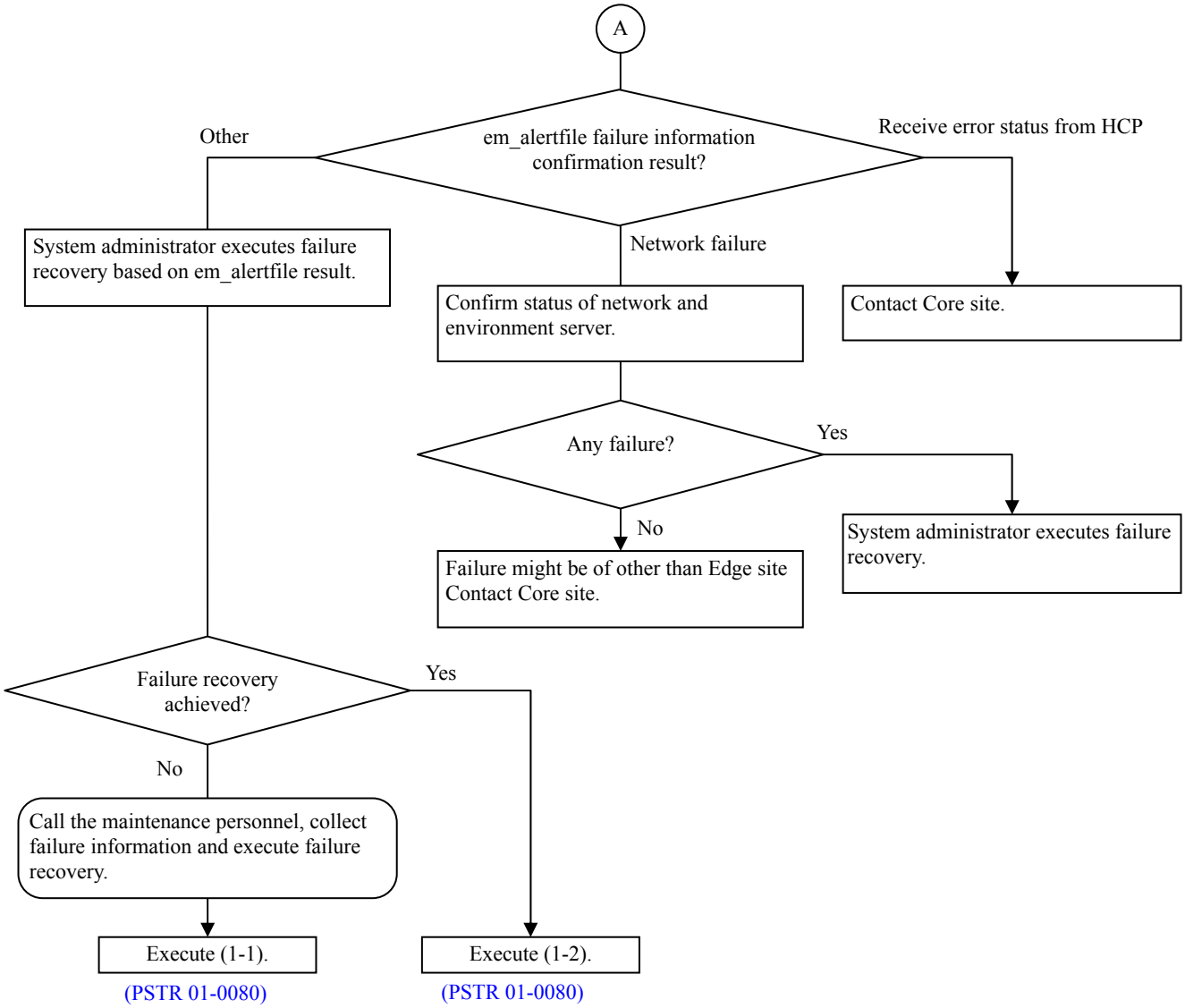

Figure C.1.3.2-1 Overview of Determination Flow by System Administrator (2/4)

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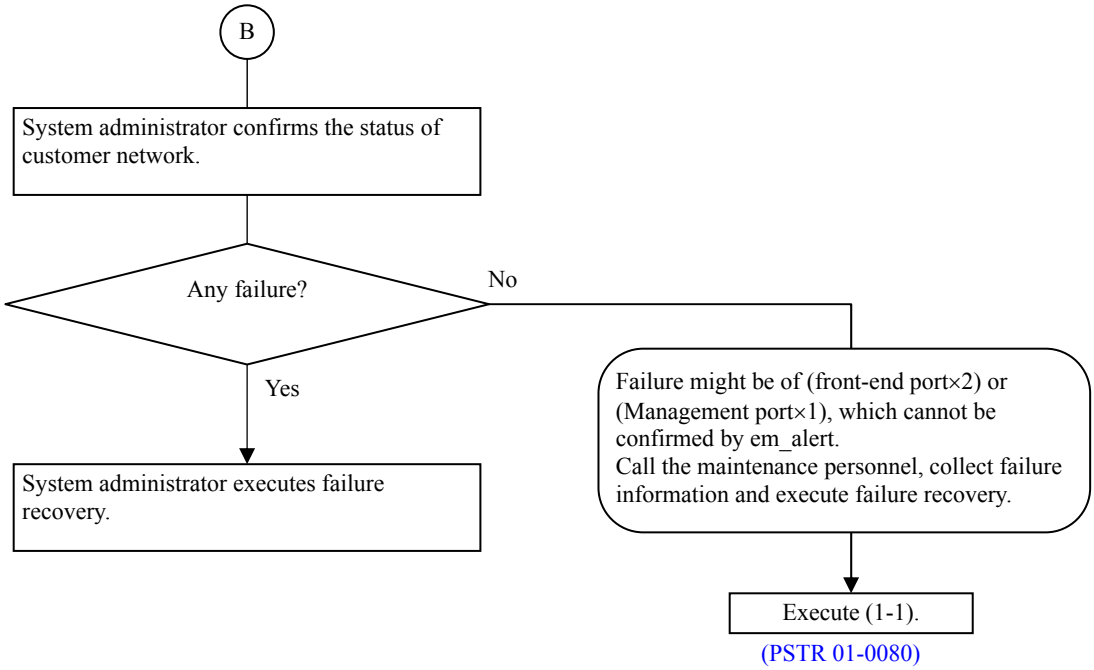

Figure C.1.3.2-1 Overview of Determination Flow by System Administrator (3/4)

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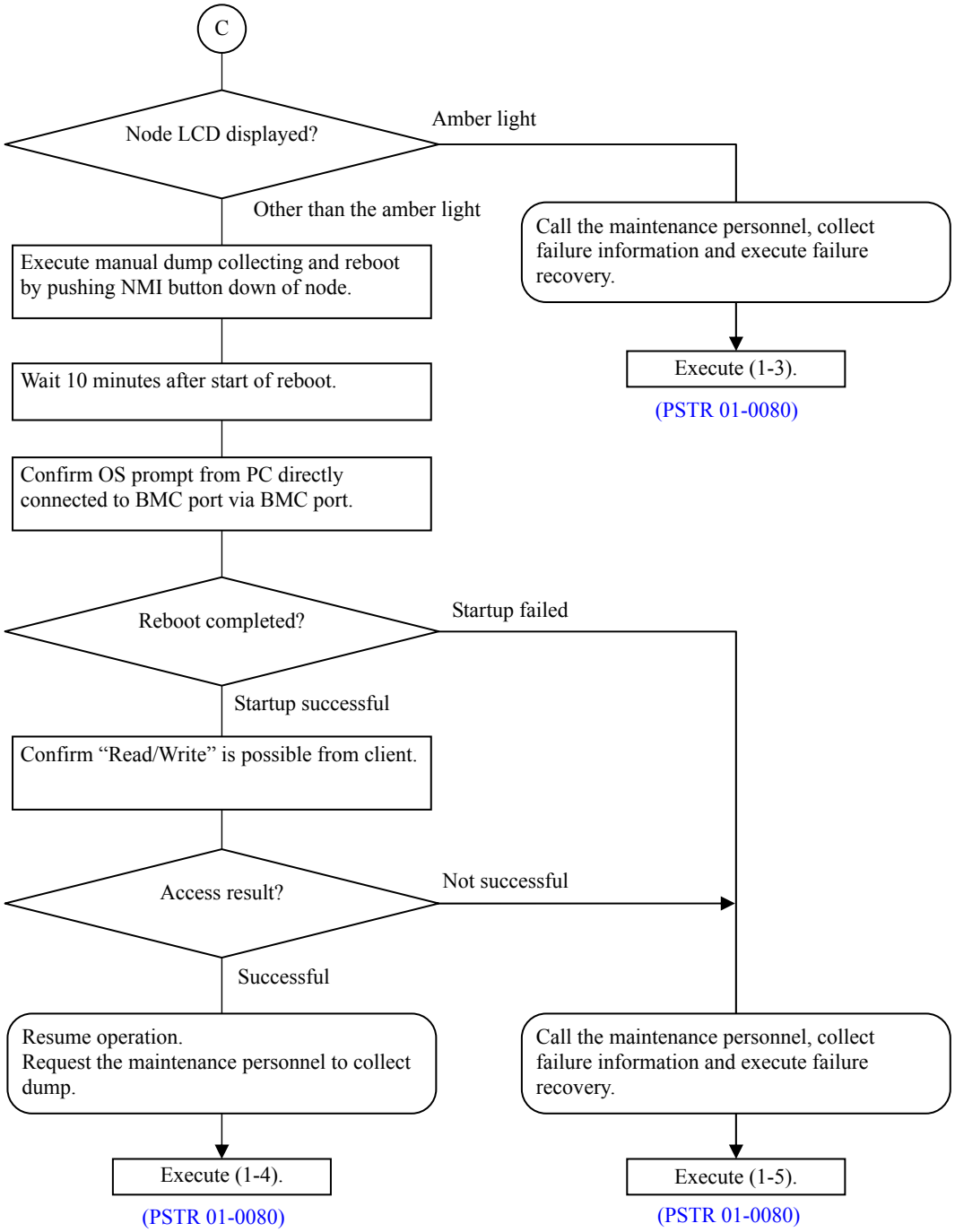

Figure C.1.3.2-1 Overview of Determination Flow by System Administrator (4/4)

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(1-1) OS is running, and when the system administrator cannot restore from the failure information (such as em_alert/SNMP Trap).
Execute failure analysis and the failure determination based on the collected failure information.
Refer to 'C.2.2 Determination Procedure when a Failure Occurred' for the details of failure analysis and determination process of a failure.

(1-2) OS is running, and when the system administrator can be restored from the failure information (such as em_alert/SNMP Trap).
Because the restarting operation is available, collect the failure information from the system administrator.

(1-3) It cannot confirm that the OS is running or not, and the LCD display color of a node shows amber.
Execute failure analysis and the failure determination based on the collected failure information.
Refer to 'C.2.2 Determination Procedure when a Failure Occurred' for the details of failure analysis and determination process of a failure.

(1-4) When the system administrator executes the dump manually and then after collecting the dump manually, the system starts automatically and confirmed that the I/O operation is available (This is executed when it is unknown if the OS is running and the LCD display color shows blue.)
Because the restarting operation is available, collect the failure information from the system administrator.

(1-5) After collecting the dump manually by the system administrator, the system does not start automatically or the I/O operation cannot be done after restarting. (This is executed when it is unknown if the OS is running and the LCD display color shows blue.)
Execute failure determination operation.
Refer to 'C.2.2 Determination Procedure when a Failure Occurred' for the details of failure analysis and determination process of a failure.

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C.1.4 When the Maintenance Personnel Noticed the Failure at the Time of Initial Installation in the Local Site

When the maintenance personnel noticed the failure message displayed on LCD of the node in which the failure occurred, LCD display of the parts and LED lighting of the parts, perform the local initial measurement and failure analysis according to the following.

(1) Check LCD display of the node in which the failure occurred, alarm lighting of the installed parts, and others.

(2) Perform "hwstatus" for the node in which the failure occurred. For the details of "hwstatus", refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.

(3) Acquire the result of "hwstatus". Note that the connection (remote node BMC connection status) of BMC Information becomes "none" (cluster not built) at the time of initial installation because it is before the cluster building. The connection of BMC information is not displayed in the single node configuration.

(4) Based on the result of "hwstatus", replace the failure occurrence parts of the failure occurrence node.
For the details of the part replacement, refer to "Replacement 'Chapter 1 Replacing the Components of Hitachi Data Ingestor' (REP 01-0000)".

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C.1.5 Determination Procedure for the Possible Failure Part when a PCI Error Occurred

It is not required for DELL™ PowerEdge™ R710.

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C.2 Failure Determination Procedure

C.2.1 Procedures of Troubleshooting at the Time of Setup

(1) Figure C.2.1-1 shows the flowchart when message IDs #1 to #5 on "Set Up 'Table 6.1-1 List of Messages' (SETUP 06-0010)" are output due to the failure of new installation or the failure of update installation. Table C.2.1-1 shows the output message IDs.

Table C.2.1-1 List of Message IDs

Message ID	KAQG61007-E KAQG61008-E KAQG61010-E KAQG61025-E KAQG61027-E

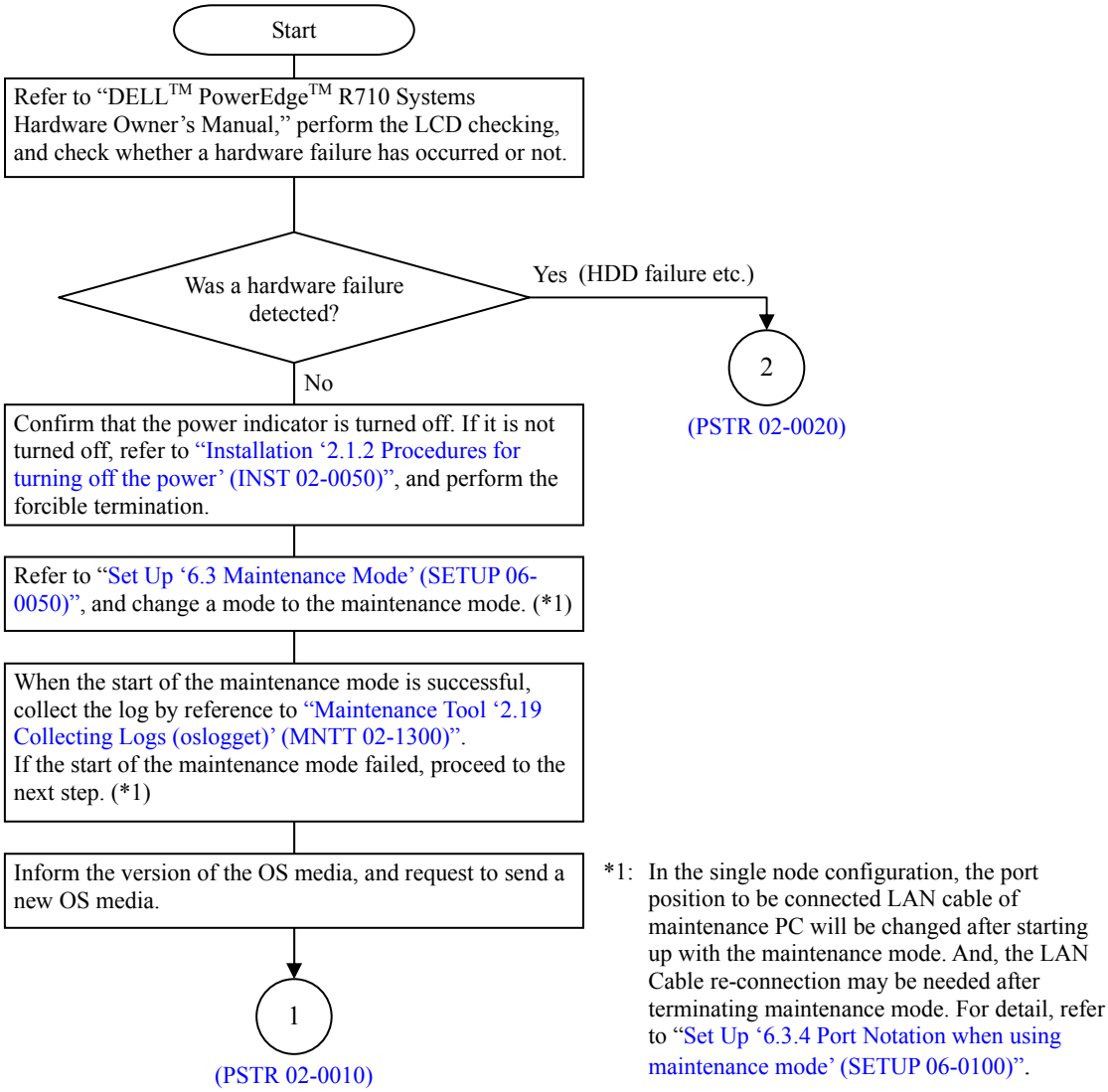

Figure C.2.1-1 Media Failure Measurement Flow (1/3)

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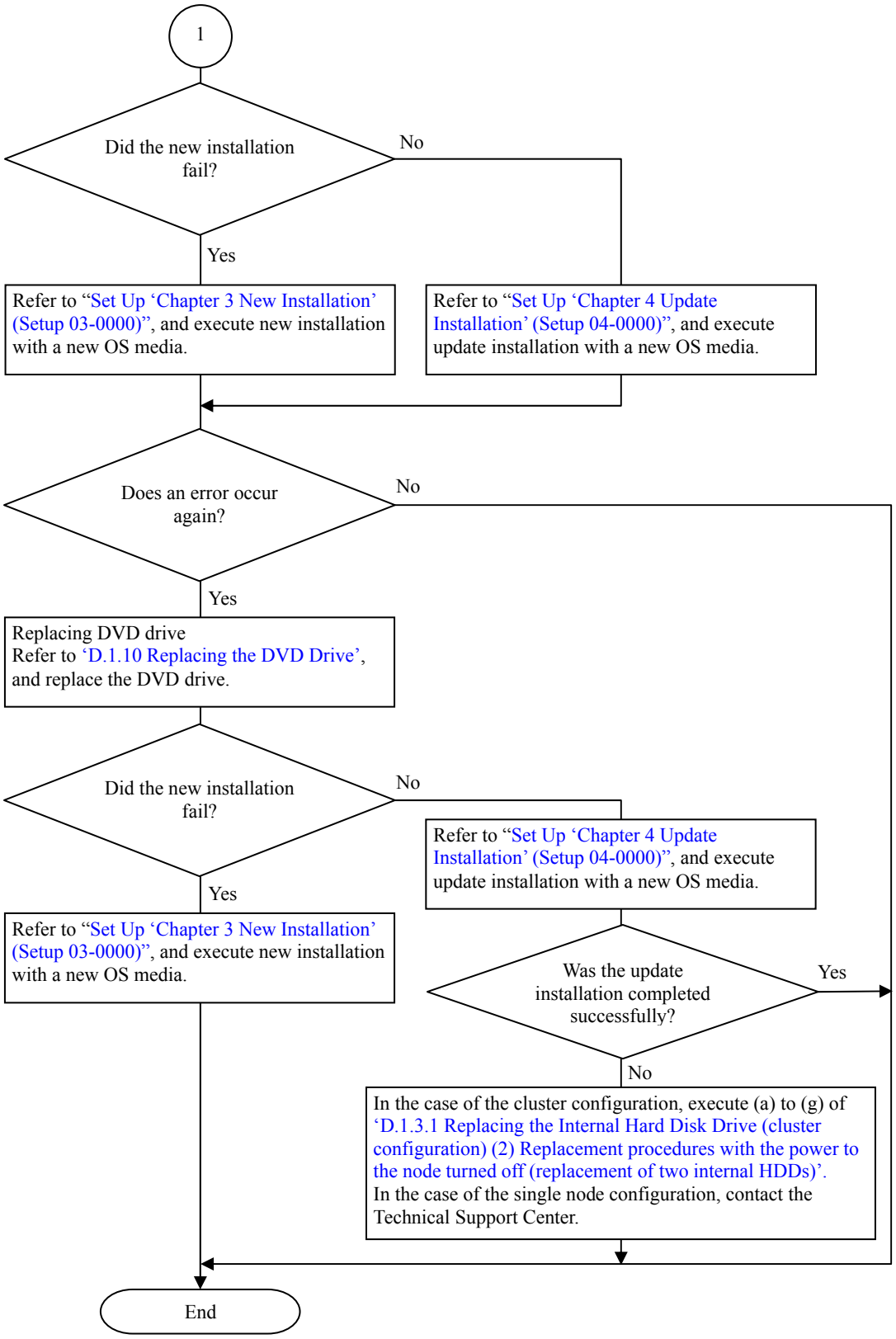

Figure C.2.1-1 Media Failure Measurement Flow (2/3)

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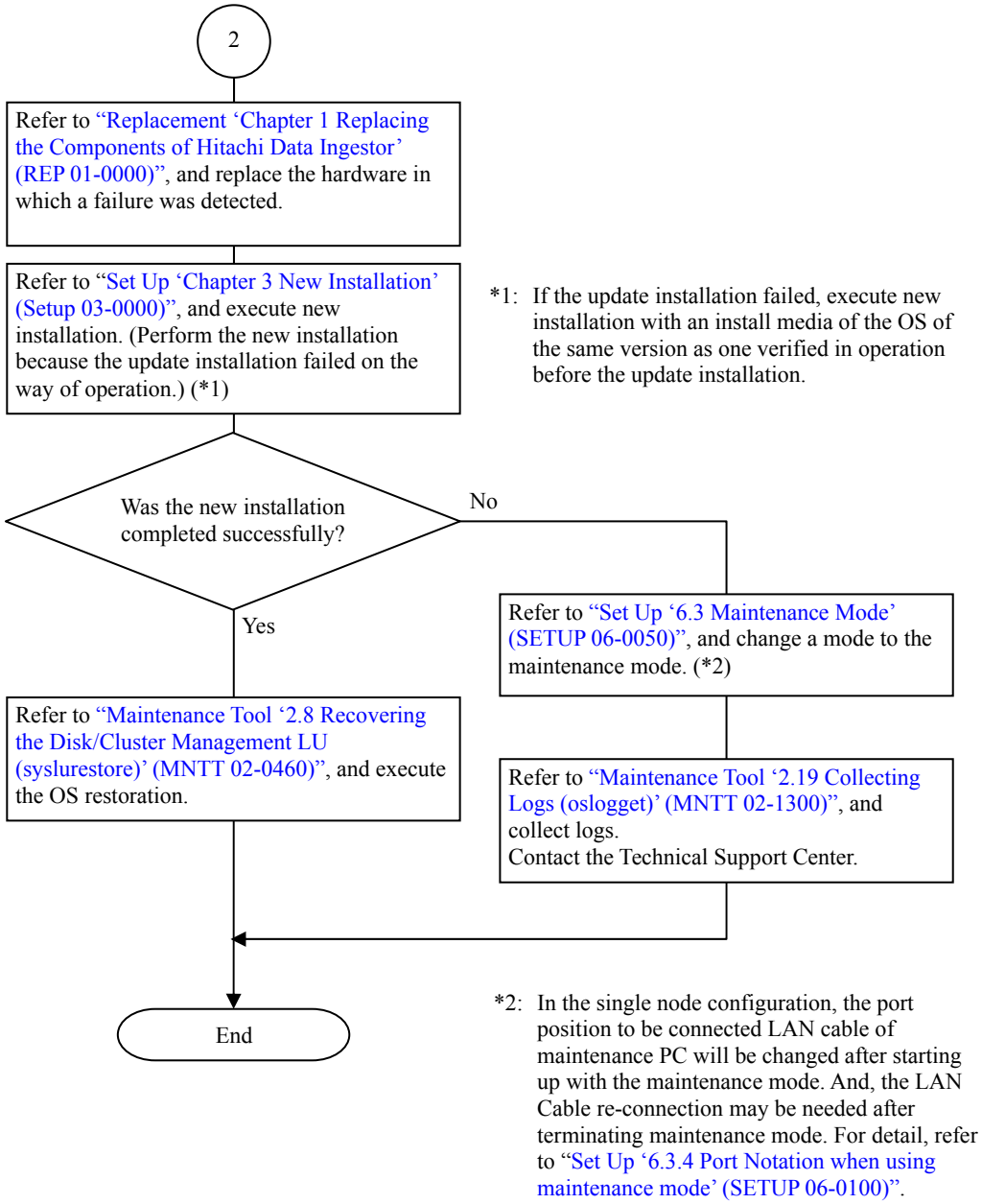

Figure C.2.1-1 Media Failure Measurement Flow (3/3)

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(2) Figure C.2.1-2 shows the flow when message IDs #6 to #23 on "Set Up 'Table 6.1-1 List of Messages' (SETUP 06-0020)" are output due to new installation failures.
Table C.2.1-2 shows the output message IDs.

Table C.2.1-2 Message IDs List

Message ID	KAQG61020-E	KAQG61021-E	KAQG61022-E	KAQG61009-E	KAQG61011-E
	KAQG61012-E	KAQG61013-E	KAQG61014-E	KAQG61015-E	KAQM01024-E
	KAQM01025-E	KAQM01026-E	KAQM01028-E	KAQM01097-E	KAQM14105-E
	KAQM14134-E	KAQM14150-E	KAQM14152-E		

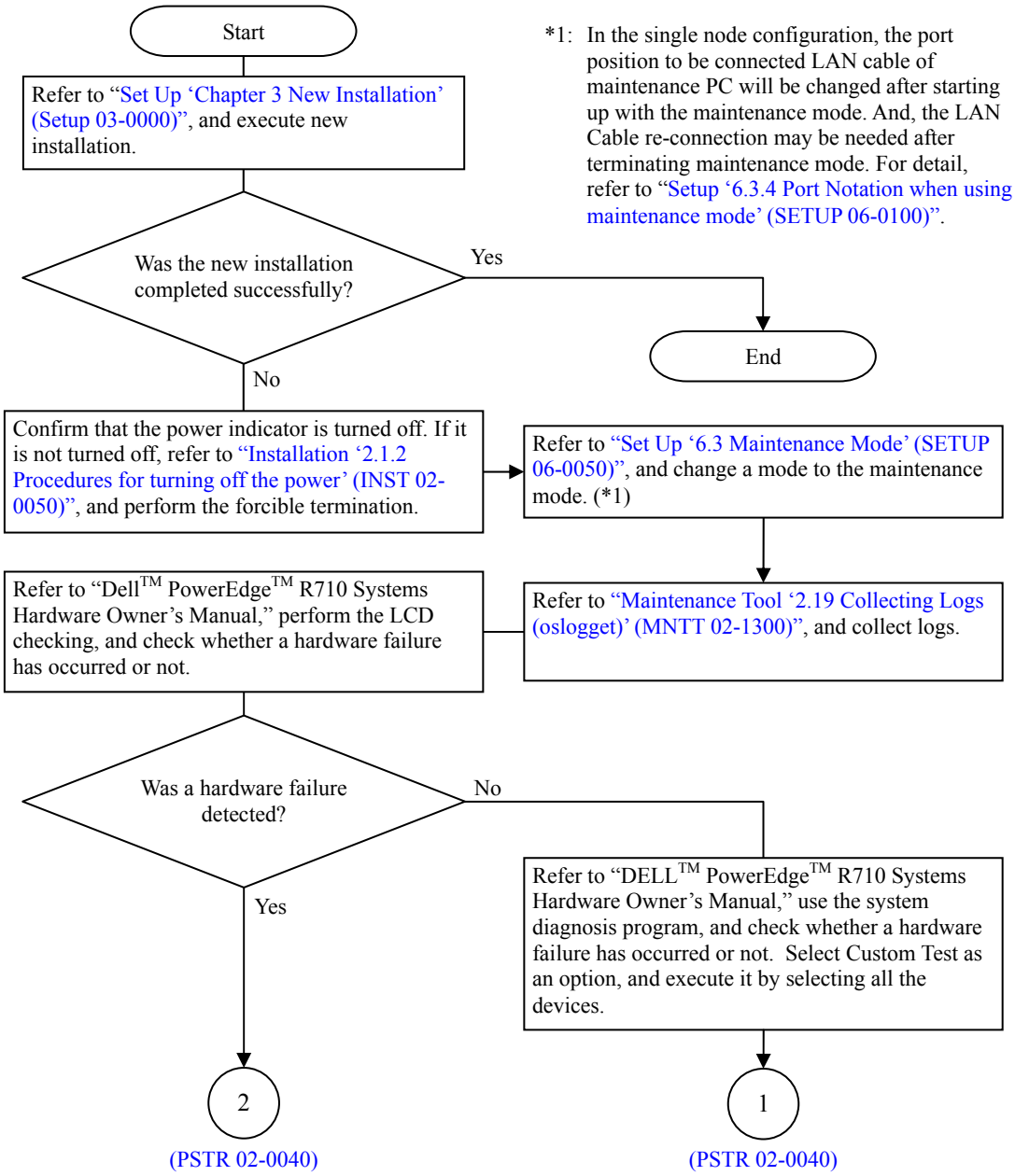

Figure C.2.1-2 Measurement Flow for the New Installation Failures (1/2)

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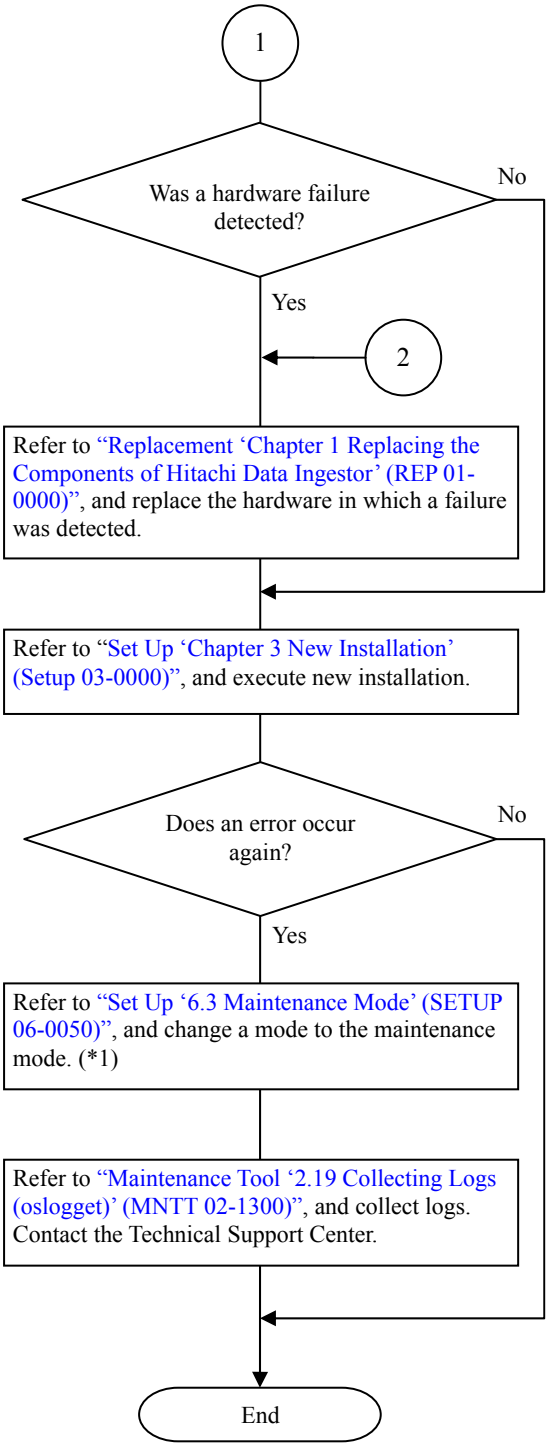

*1: In the single node configuration, the port position to be connected LAN cable of maintenance PC will be changed after starting up with the maintenance mode. And, the LAN Cable re-connection may be needed after terminating maintenance mode. For detail, refer to "Set Up '6.3.4 Port Notation when using maintenance mode' (SETUP 06-0100)".

Figure C.2.1-2 Measurement Flow for the New Installation Failures (2/2)

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(3) Figure C.2.1-3 shows the flow when message IDs #6 to #24 on "Set Up 'Table 6.1-1 List of Messages' (SETUP 06-0020)" are output due to update installation failures.
Table C.2.1-3 shows the output message IDs.

Table C.2.1-3 Message IDs List

Message ID	KAQG61009-E KAQG61020-E KAQG61021-E KAQG61022-E KAQG61011-E KAQG61012-E KAQG61013-E KAQG61014-E KAQG61015-E KAQG61016-E KAQM01024-E KAQM01025-E KAQM01026-E KAQM01028-E KAQM01097-E KAQM14105-E KAQM14134-E KAQM14150-E KAQM14152-E

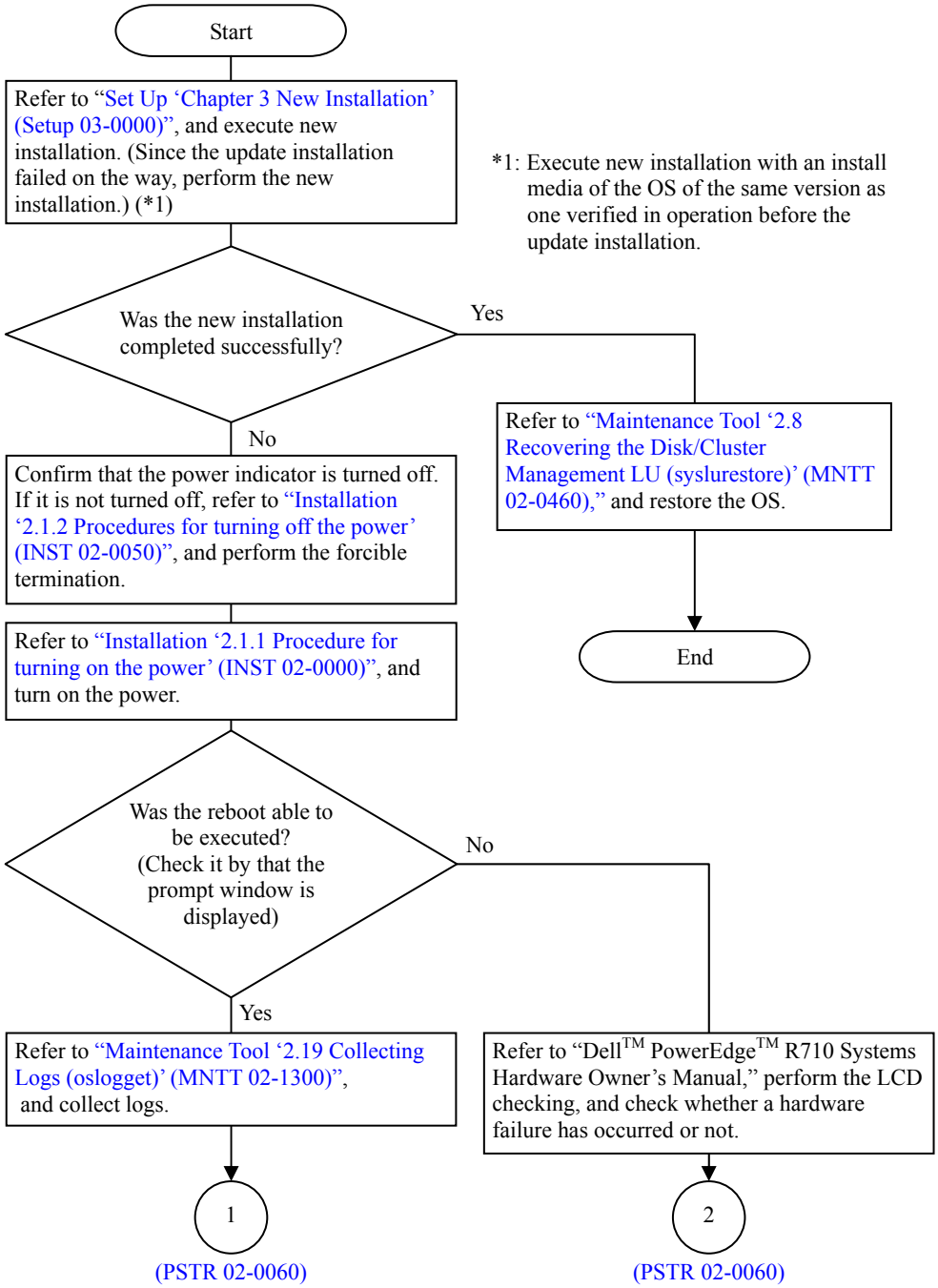

Figure C.2.1-3 Measurement Flow for the Update Installation Failures (1/4)

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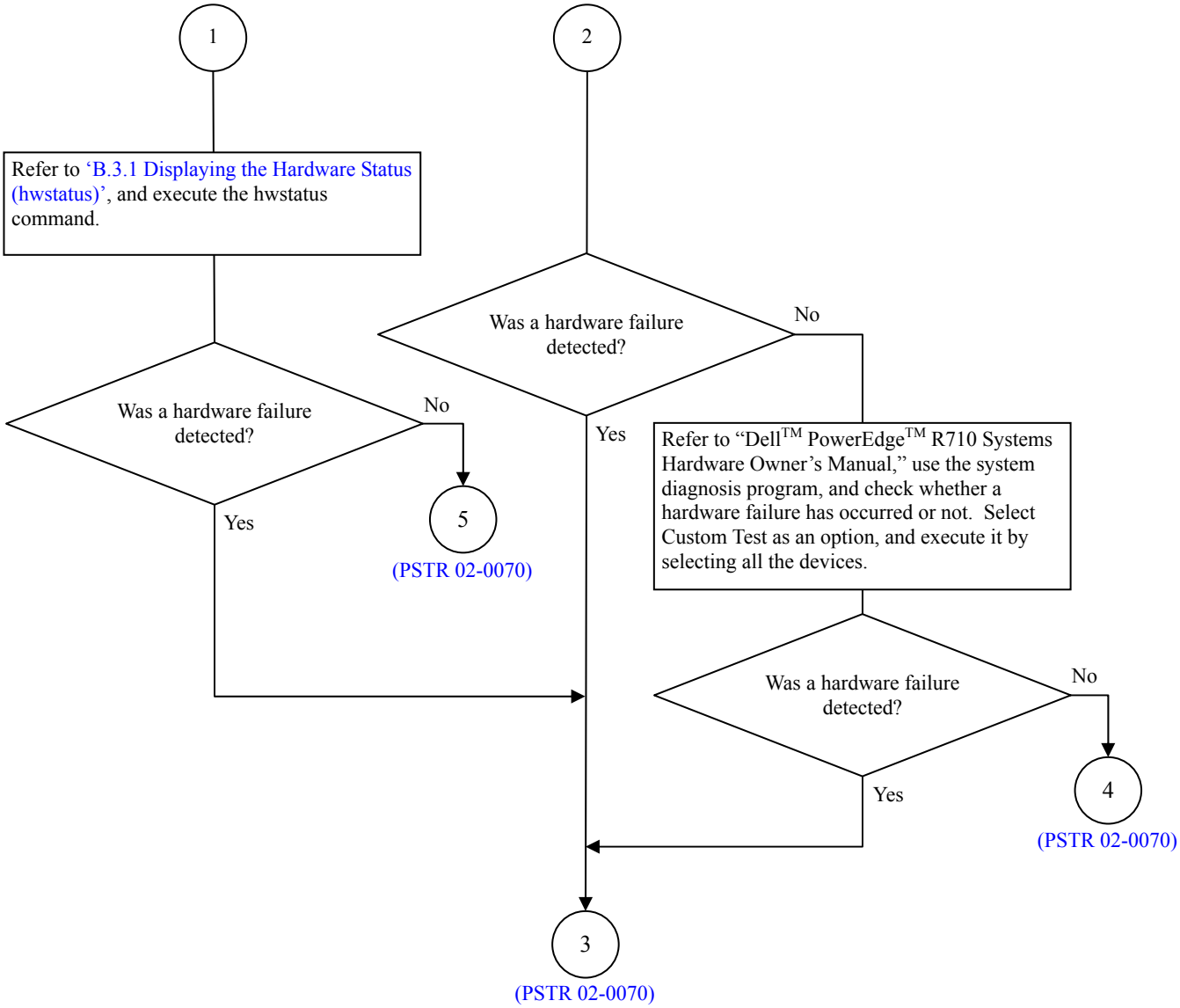

Figure C.2.1-3 Measurement Flow for the Update Installation Failures (2/4)

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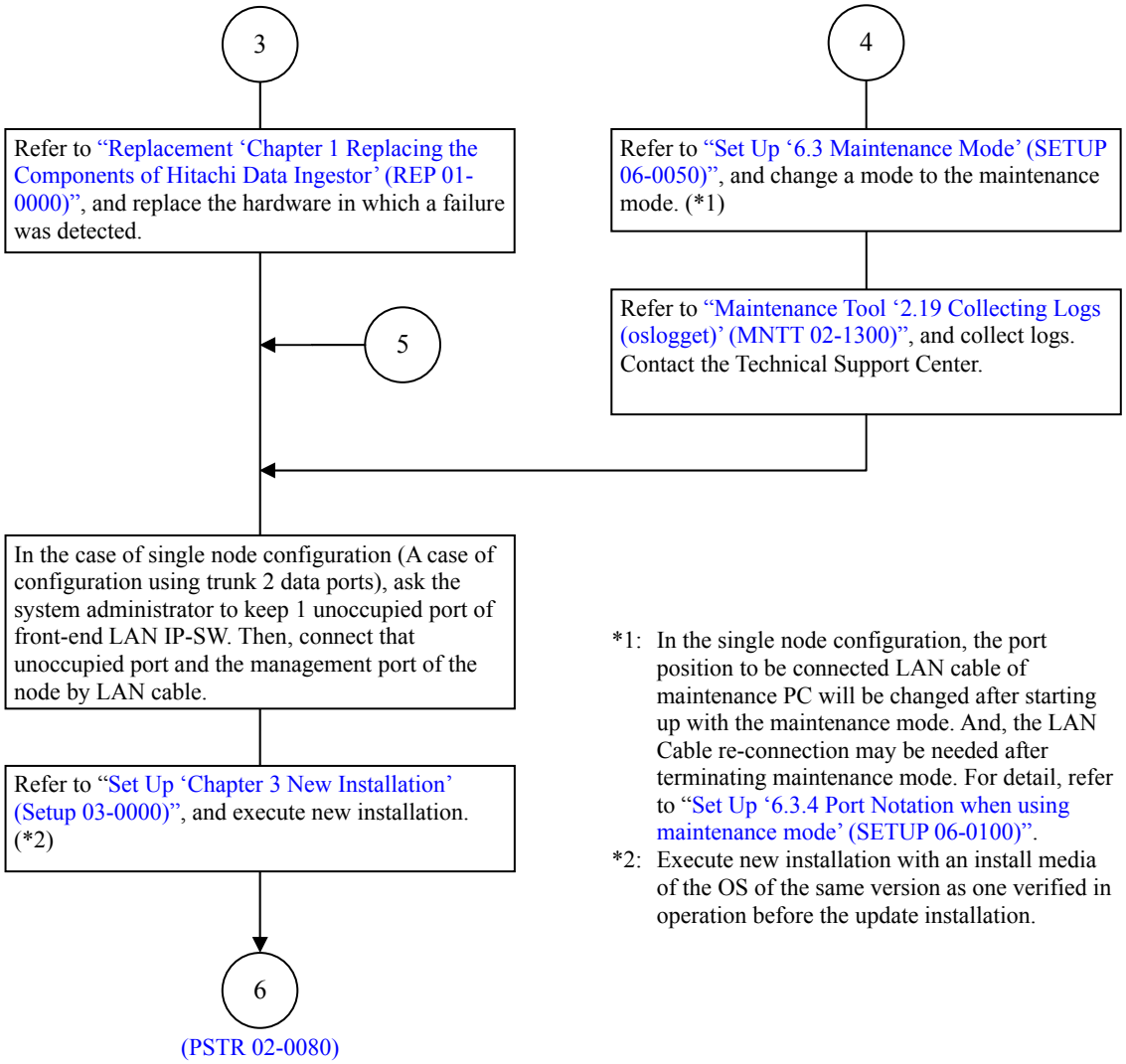

Figure C.2.1-3 Measurement Flow for the Update Installation Failures (3/4)

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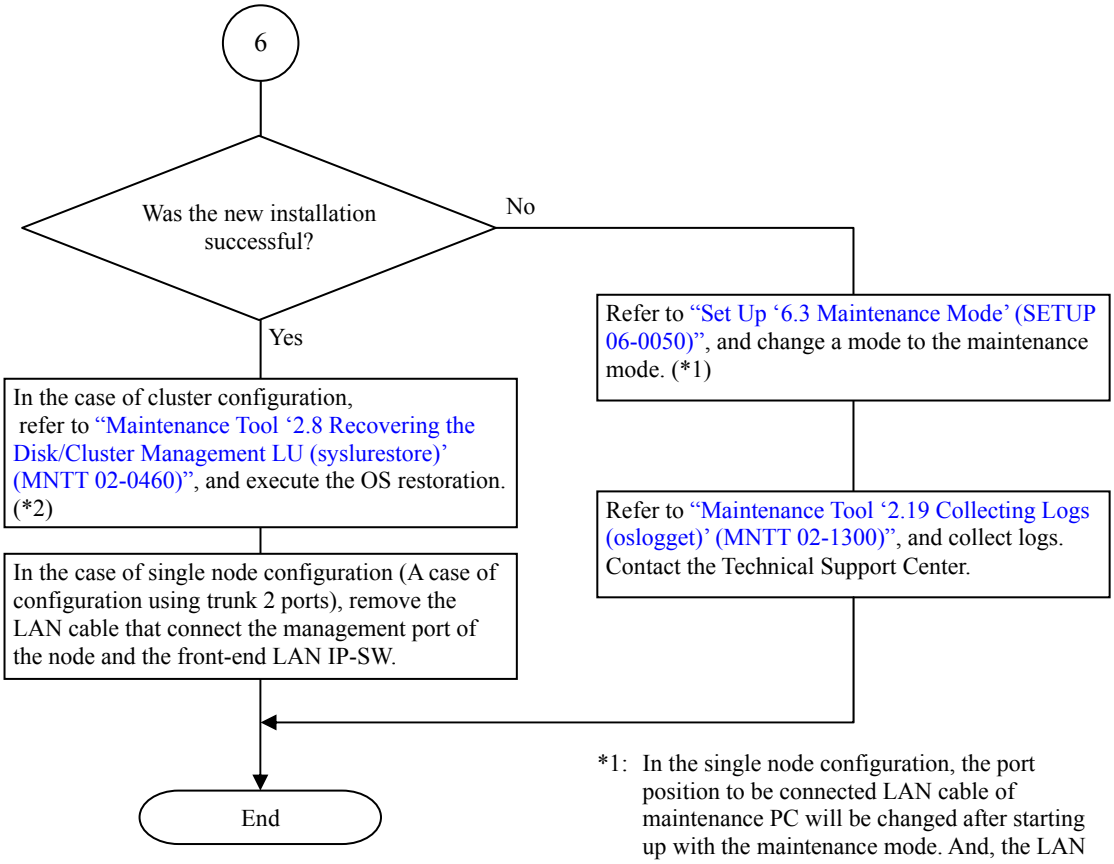

*1: In the single node configuration, the port position to be connected LAN cable of maintenance PC will be changed after starting up with the maintenance mode. And, the LAN Cable re-connection may be needed after terminating maintenance mode. For detail, refer to "Set Up '6.3.4 Port Notation when using maintenance mode' (SETUP 06-0100)".

*2: In the case of single node configuration, ask the system administrator to restore the system parameter settings.

Figure C.2.1-3 Measurement Flow for the Update Installation Failures (4/4)

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(4) Figure C.2.1-4 shows the flow when message ID #25 on "Set Up 'Table 6.1-1 List of Messages' (SETUP 06-0020)" is output due to update installation failures.
Table C.2.1-4 shows the output message ID.

Table C.2.1-4 Message ID List

Message ID	KAQG61018-W

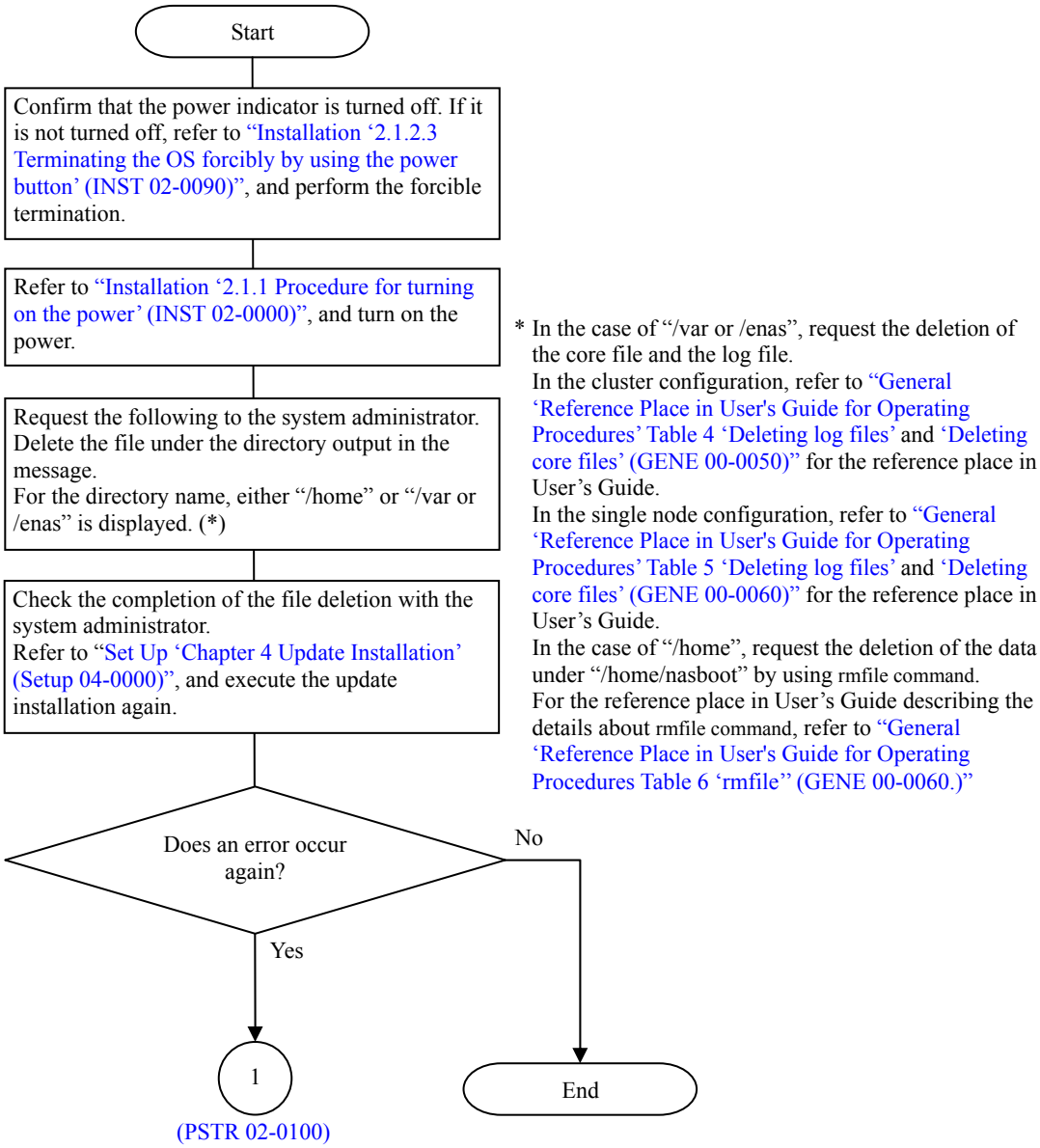

Figure C.2.1-4 Measurement Flow for the Lack of Free Space (1/2)

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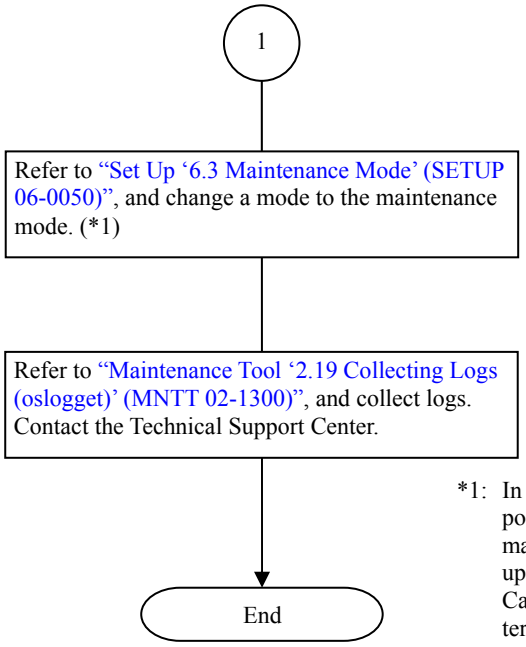

*1: In the single node configuration, the port position to be connected LAN cable of maintenance PC will be changed after starting up with the maintenance mode. And, the LAN Cable re-connection may be needed after terminating maintenance mode. For detail, refer to "Set Up '6.3.4 Port Notation when using maintenance mode' (SETUP 06-0100)".

Figure C.2.1-4 Measurement Flow for the Lack of Free Space (2/2)

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(5) Figure C.2.1-5 shows the flow when message ID #26 on "Set Up 'Table 6.1-1 List of Messages' (SETUP 06-0020)" is output due to the version check of update installation.
Table C.2.1-5 shows the output message ID.

Table C.2.1-5 Message ID List

Message ID	KAQG61024-E

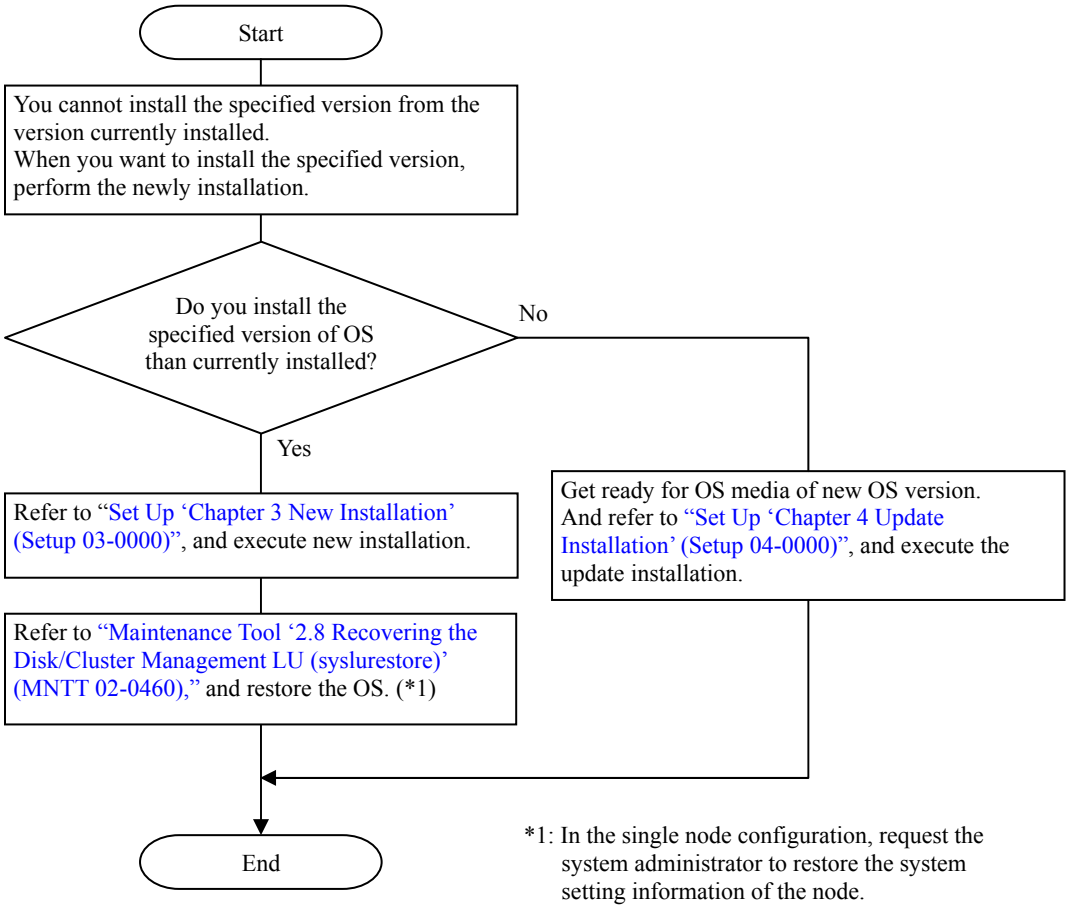

Figure C.2.1-5 Action flow after the version check of update installation

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(6) Figure C.2.1-6 shows the flowchart when the message ID #27 of "Set Up 'Table 6.1-1 List of Messages' (SETUP 06-0020)" is displayed because the update installation is executed for the device where no OS is installed. The message ID shown on the window is described in Table C.2.1-6.

Table C.2.1-6 Message ID List

Message ID	KAQG61028-E

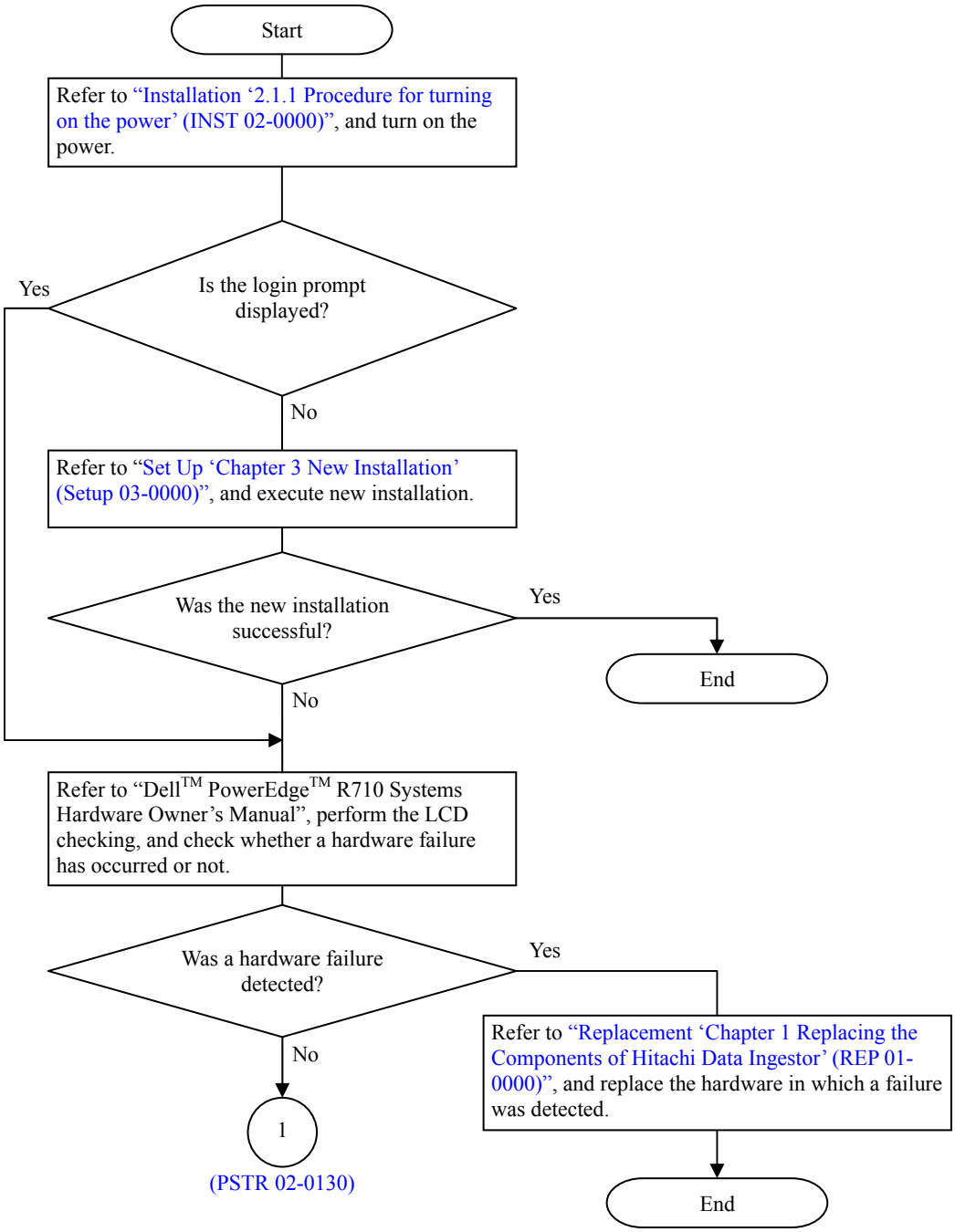

Figure C.2.1-6 Corresponding flowchart when the update installation failed (1/2)

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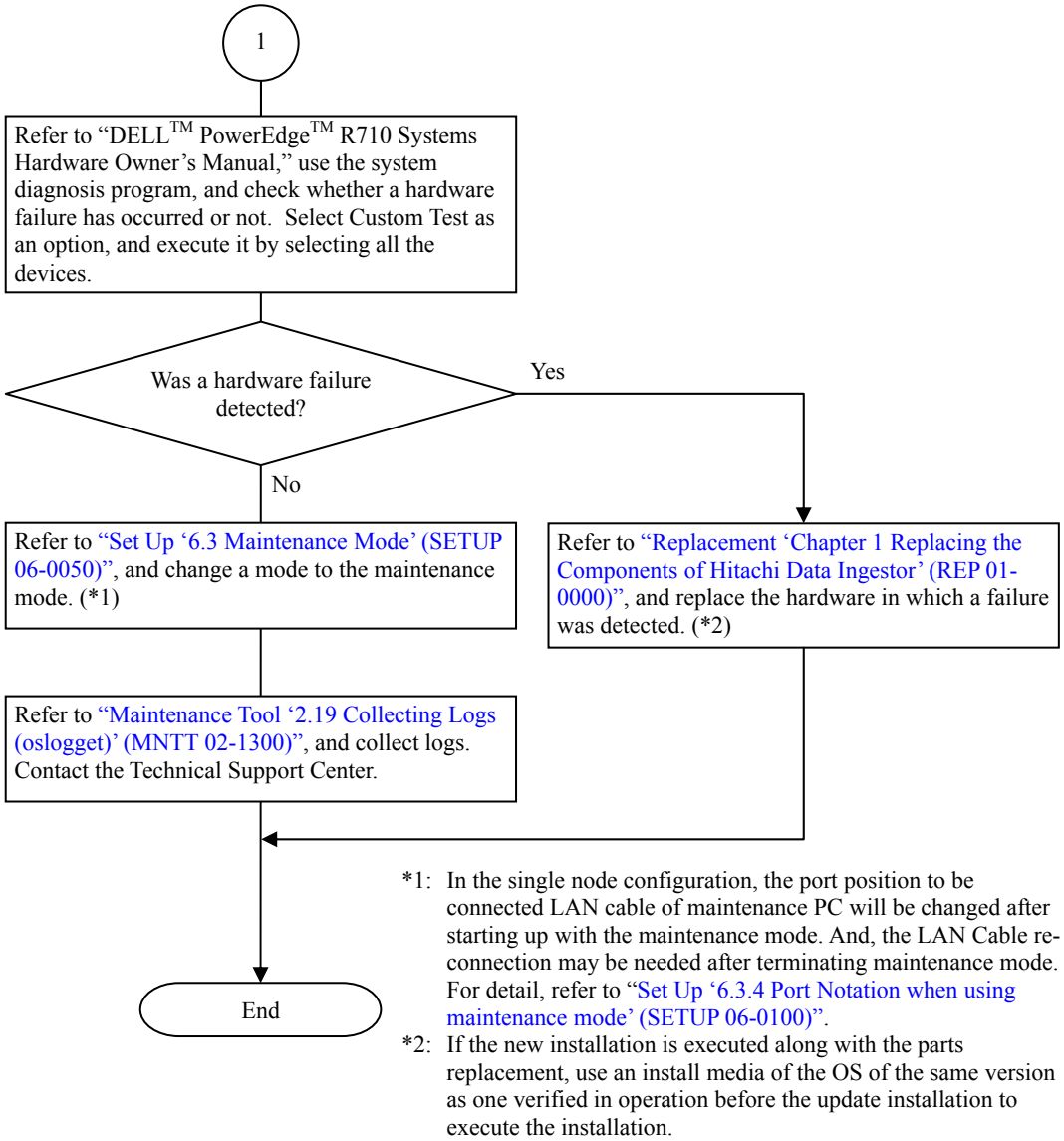

*1: In the single node configuration, the port position to be connected LAN cable of maintenance PC will be changed after starting up with the maintenance mode. And, the LAN Cable re-connection may be needed after terminating maintenance mode. For detail, refer to "Set Up '6.3.4 Port Notation when using maintenance mode' (SETUP 06-0100)".

*2: If the new installation is executed along with the parts replacement, use an install media of the OS of the same version as one verified in operation before the update installation to execute the installation.

Figure C.2.1-6 Corresponding flowchart when the update installation failed (2/2)

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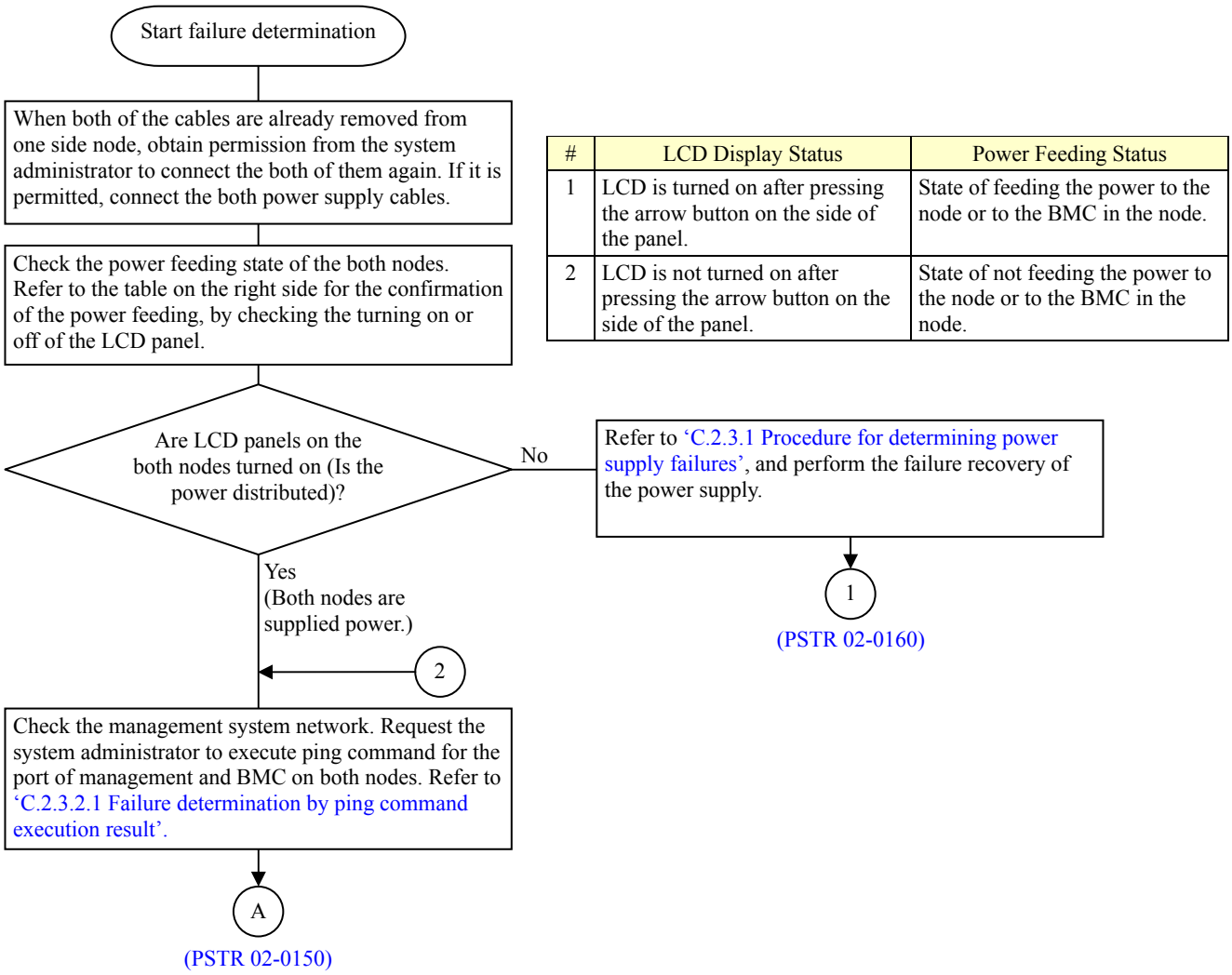
C.2.2 Determination Procedure when a Failure Occurred

C.2.2.1 Failure determination procedure in the cluster configuration

After checking the power supply and the management system network, the failure is determined to either a hardware system failure or a software system failure depending on whether SIM of failover is acquired or not. The entire flow of the failure determination is shown below.

NOTE:
- If the OS version 5.1.0-XX and later, and File Snapshots Function or File Version Restore Function is used, “differential-data snapshot” or “data of the past version directory” might be inaccessible for a moment after performing failover or failback. Contact the system administrator when failover or failback is to be performed.
- If the logical failure is occured on the file system using the Active File Migration or the Large file transfer, the maintenance personnel might not be able to identify the failure location with the failure determination procedure. Before the completion maintenance procedure, inform system administrator that they can start recovering the work space for AFM.



#	LCD Display Status	Power Feeding Status
1	LCD is turned on after pressing the arrow button on the side of the panel.	State of feeding the power to the node or to the BMC in the node.
2	LCD is not turned on after pressing the arrow button on the side of the panel.	State of not feeding the power to the node or to the BMC in the node.

Figure C.2.2.1-1 Procedure for determining failures (1/3)

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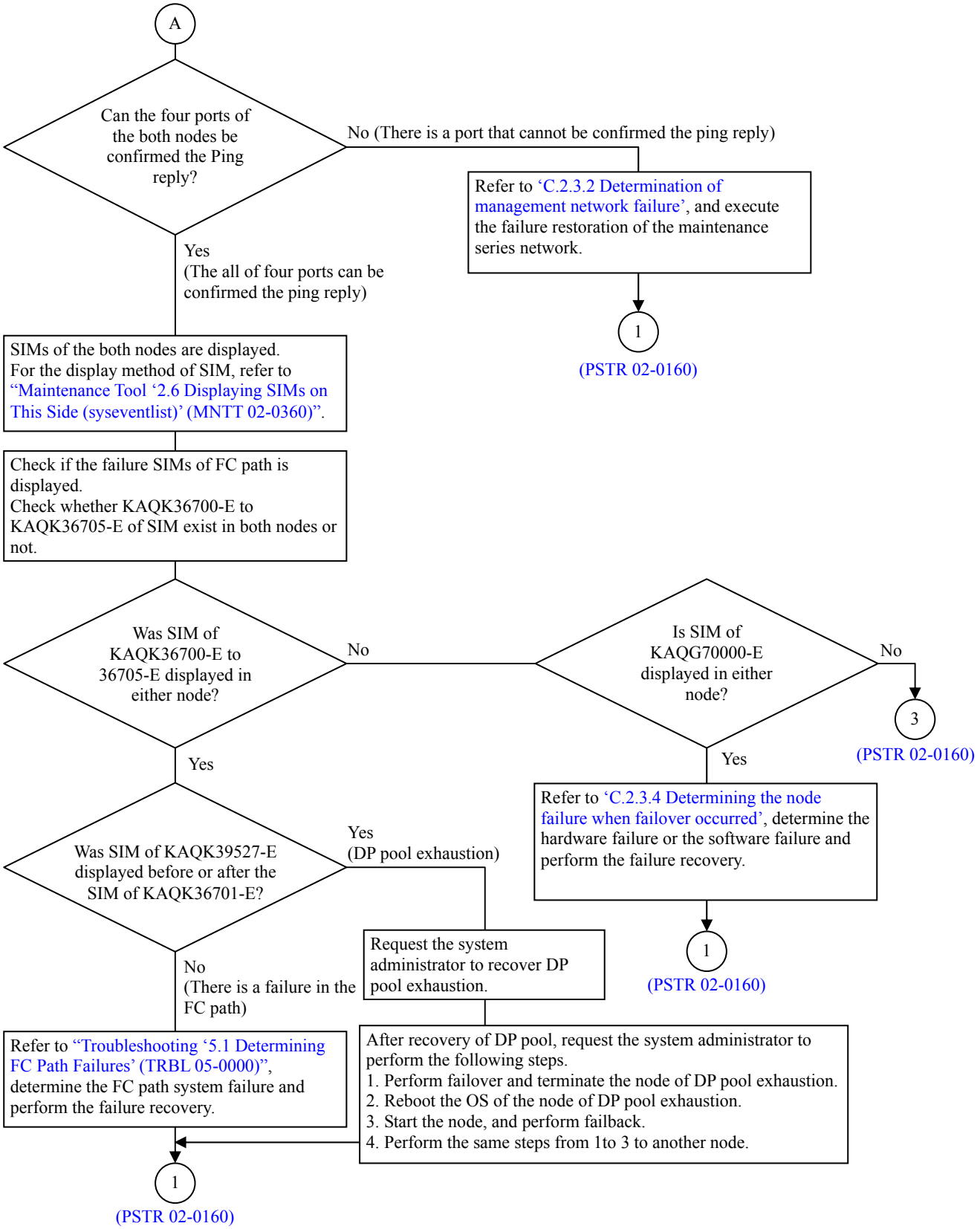

Figure C.2.2.1-1 Procedure for determining failures (2/3)

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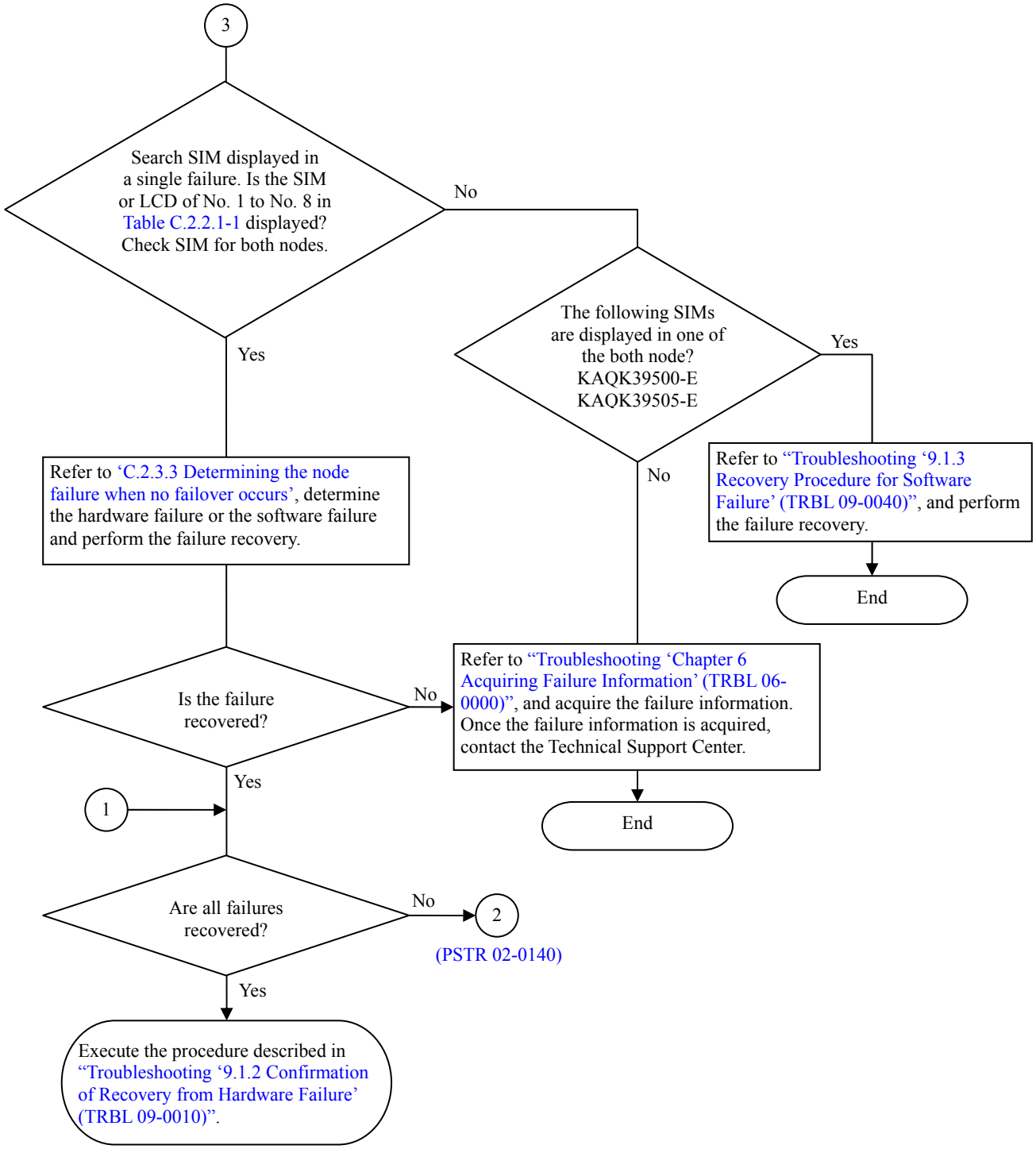

Figure C.2.2.1-1 Procedure for determining failures (3/3)

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Table C.2.2.1-1 Failed parts shown by SIM or LCD

#	SIM	Display of LCD status or message code (*1)	LED status	Checking the status by the hwstatus command (*2)	Failed part
1	KAQG72012-W	—	—	—	Heartbeat LAN port or Heartbeat LAN cable (*3) (*4)
2	KAQG81003-W	—	—	Is the port status “Link down”?	Extension NIC port or cable (*3) (*4)
3	KAQK31500-E	Lighting in amber E1610 E1614 E1618 E161C E1620 E1624 E1626 E1629	—	Is the power supply status “failed”?	One power supply unit
4	KAQK32500-E	E1310 E1311 E1313	—	Is the FAN status “failed”?	One FAN
5	KAQK37506-E	E1810	The LED indication on the embedded HDD blinks in yellow four times in one second.	Is the embedded HDD status “failed”?	One embedded HDD
6	KAQK39504-E	—	—	Is the status of all ports of NIC “Link down”?	
7	—	E1211 E1228	—	Is the battery status “failed”?	Embedded battery

*1: When the LDC is displayed in amber light, refer to “Dell™ PowerEdge™ R710 Systems Hardware Owner’s Manual” provided by the hardware vendor, and check the message code that is starting from the letter “E” as in the above list.
*2: For the hwstatus command, refer to ‘B.3.1 Displaying the Hardware Status (hwstatus)’.
*3: When it is not recovered even if the cable is replaced, it is a port failure.
*4: In case of a port failure, ping from the management PC or maintenance PC, and specify which of the nodes has the port failure.

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C.2.2.2 Failure determination procedure in the single node configuration

In the single node configuration, a failure is determined to either a hardware system failure or a software system failure after checking the power supply. The entire flow of the failure determination is shown below.

NOTE:
- Because there are two configurations in the single node configuration, make sure the target configuration before the operation. For the configuration, refer to "Installation '1.1.4 Overall configuration diagram (4) Overall system configuration diagram in the configuration of HDI for Cloud (single node)' (INST 01-0078)".
- If the OS version 5.1.0-XX and later, and File Version Restore Function is used, "data of the past version directory" might be inaccessible for a moment after the start-up of the resource groups. Contact the system administrator when the resource groups are to be started or restarted.
- If the logical failure is occured on the file system using the Active File Migration or the Large file transfer, the maintenance personnel might not be able to identify the failure location with the failure determination procedure. Before the completion maintenance procedure, inform system administrator that they can start recovering the work space for AFM.

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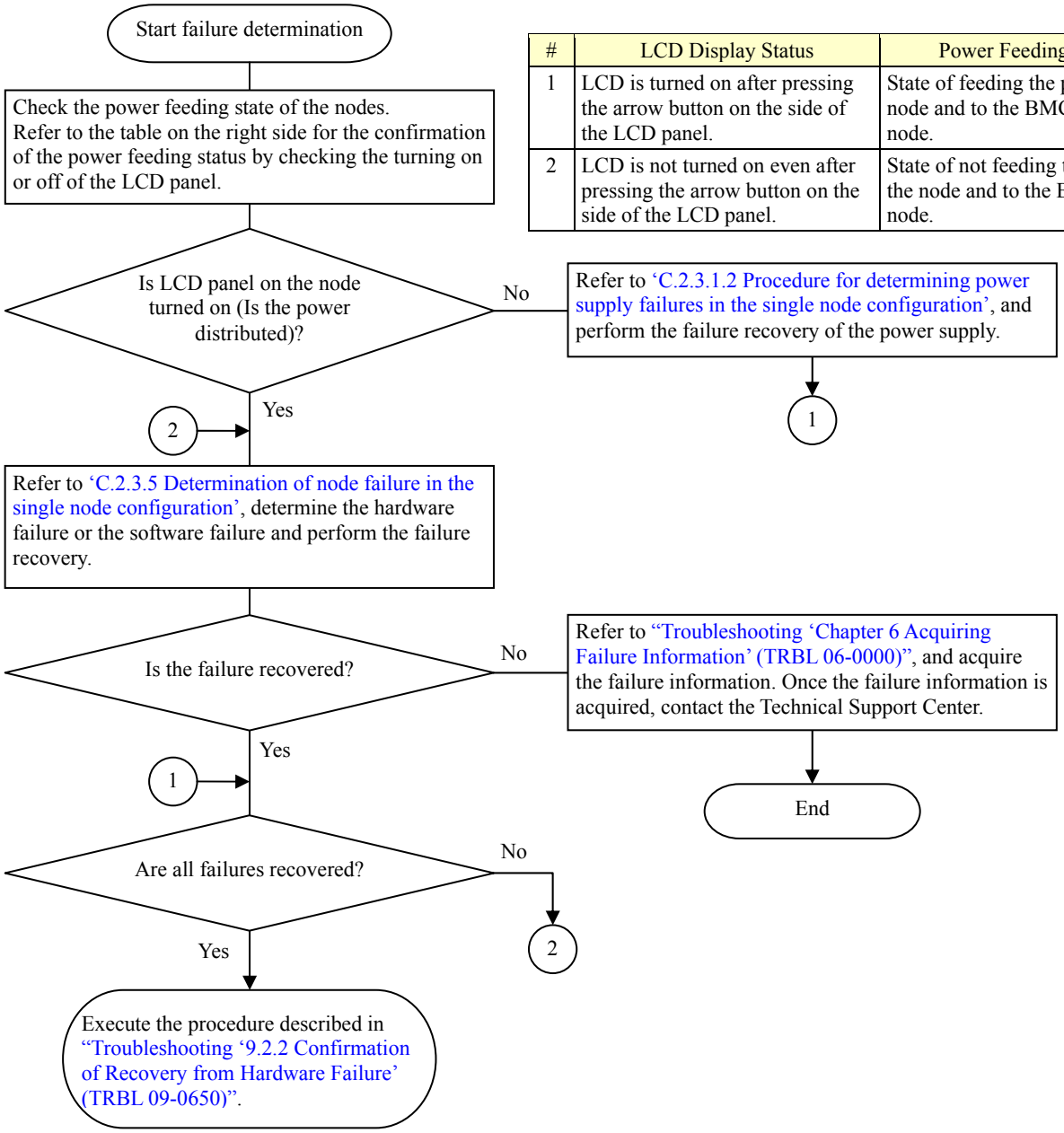

#	LCD Display Status	Power Feeding Status
1	LCD is turned on after pressing the arrow button on the side of the LCD panel.	State of feeding the power to the node and to the BMC in the node.
2	LCD is not turned on even after pressing the arrow button on the side of the LCD panel.	State of not feeding the power to the node and to the BMC in the node.

Figure C.2.2.2-1 Failure determination process in the single node configuration

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C.2.3 Detailed Determination Procedure in Each Failure

C.2.3.1 Procedure for determining power supply failures

C.2.3.1.1 Procedure for determining power supply failures in the cluster configuration

The procedure for determining power supply failures is shown in the following flow.
It is assumed that, for one side node, at least one side LED within two power units does not light up in green or the DCDC failure (DCDC is a power control part on the motherboard) occurred.

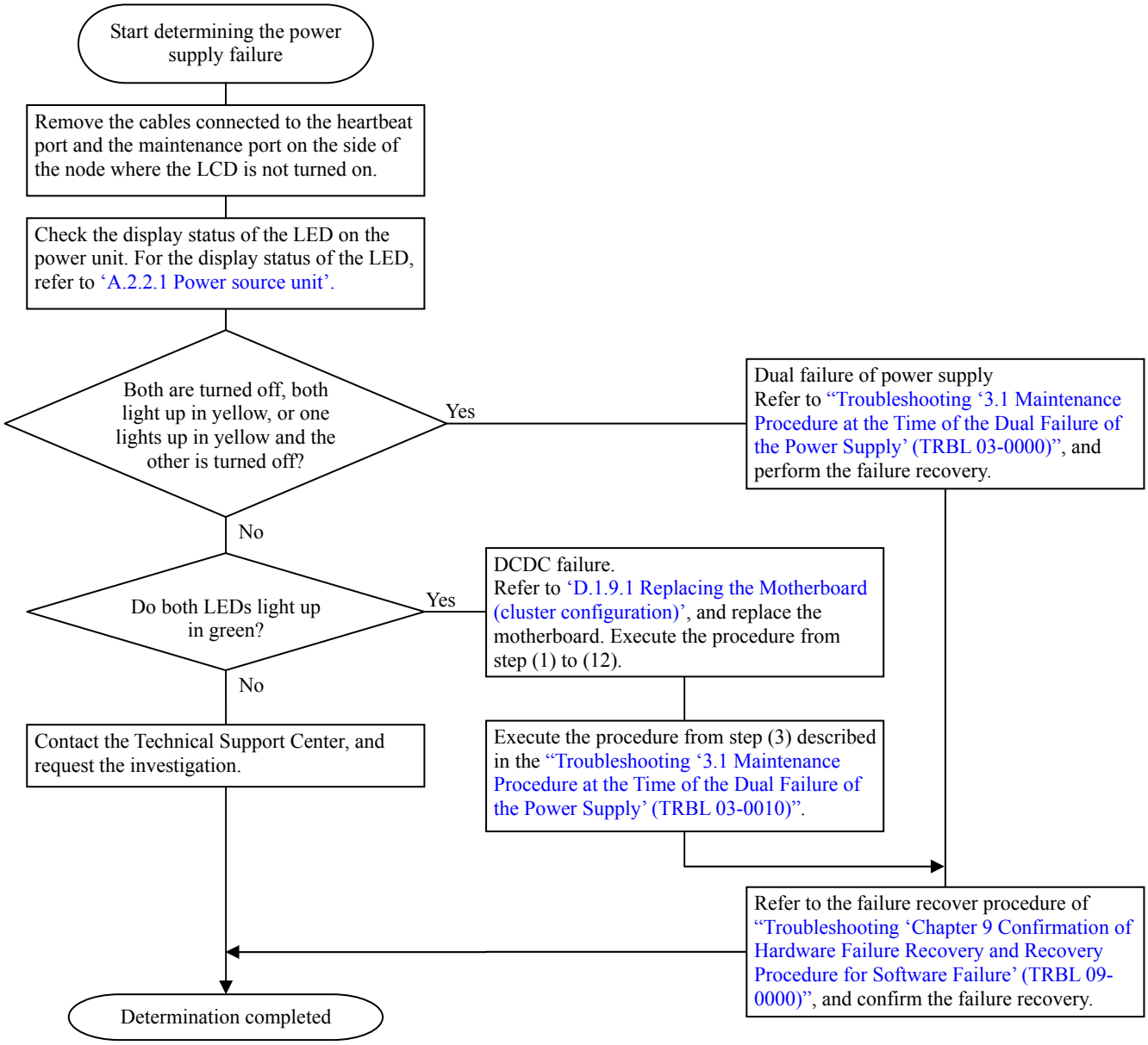

Figure C.2.3.1.1-1 Procedure for determining power supply failures

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C.2.3.1.2 Procedure for determining power supply failures in the single node configuration

The following flowchart shows the procedure of power supply failures. It is assumed that the LED of power supply unit is not turned on in green light, or DCDC failure (DCDC is a power supply control parts on the mother board) is occurred.

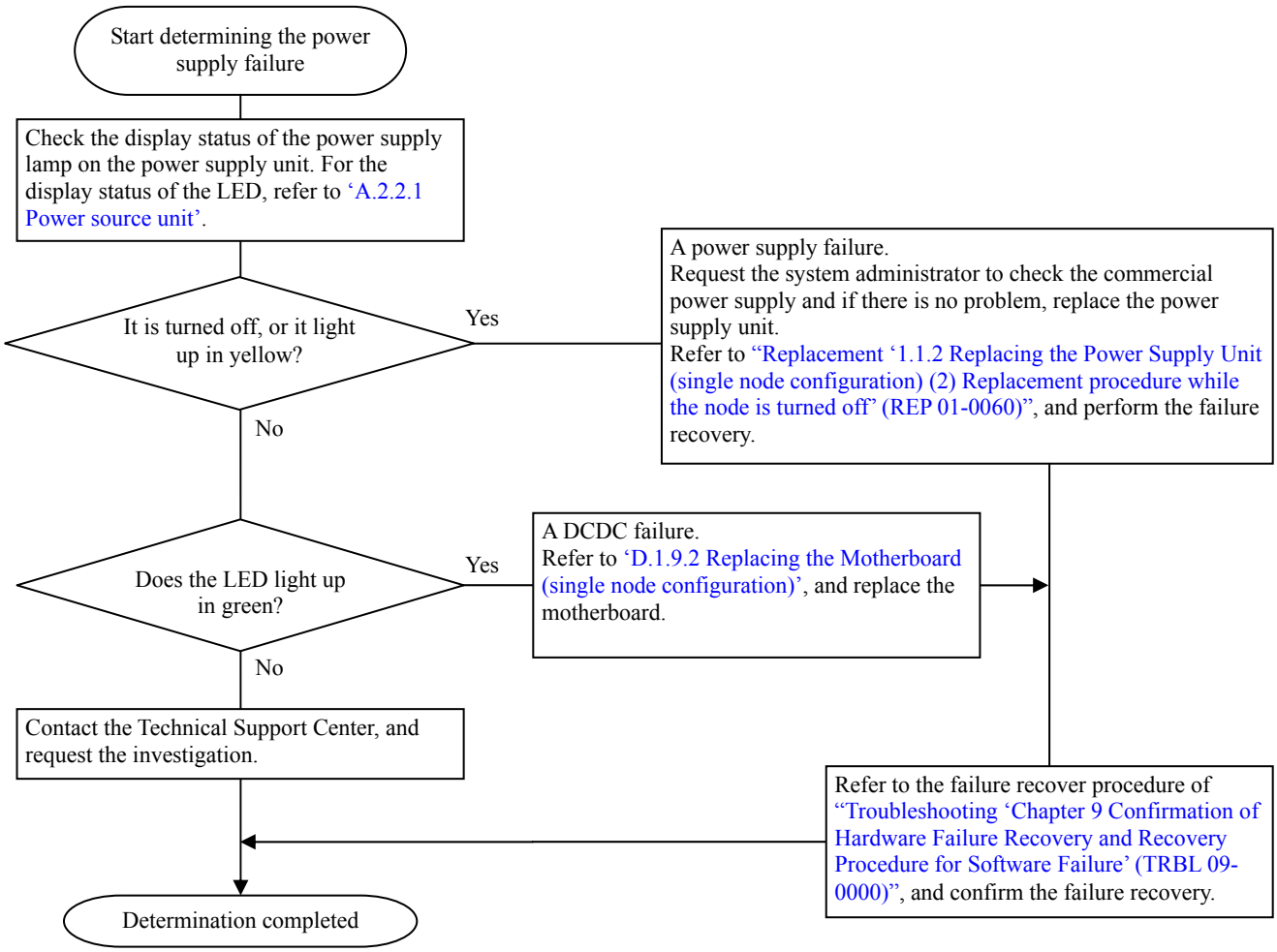

Figure C.2.3.1.2-1 Procedure for determining power supply failures

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C.2.3.2 Determination of management network failure

This section describes determination of the management network failure.
When the failure location can be identified from the failure notice, maintenance personnel should perform the recovery operation for the subject location.
When the failure location cannot be identified, determine the failed part by the determination operation described in this chapter, and then perform the recovery operation.
Check the following before performing the isolation of the failure.
Checking method varies depending on the model. However, confirm the status of the Power LED and the Status LED of IP-SW.
If the Power LED is “Off”, the power is turned off or a power failure. Check the power switch of the management LAN IP-SW, the power cable and the power to be supplied to the management LAN IP-SW. If the switch is not turned off and no problem with the power cable and the power supply, it is the IP-SW failure.
When the Status LED indicates an error, see the manual for the target product to perform the troubleshooting.

C.2.3.2.1 Failure determination by ping command execution result

Before performing the operation of management network failure determination, obtain the result (node0: mng0, BMC0 and node1: mng1, BMC1) of the ping command executed by the system administrator. Then, perform the determination operation.

Figure C.2.3.2.1-1 Overview of Checking by Using ping Command shows an overview of the checking by using the ping command.

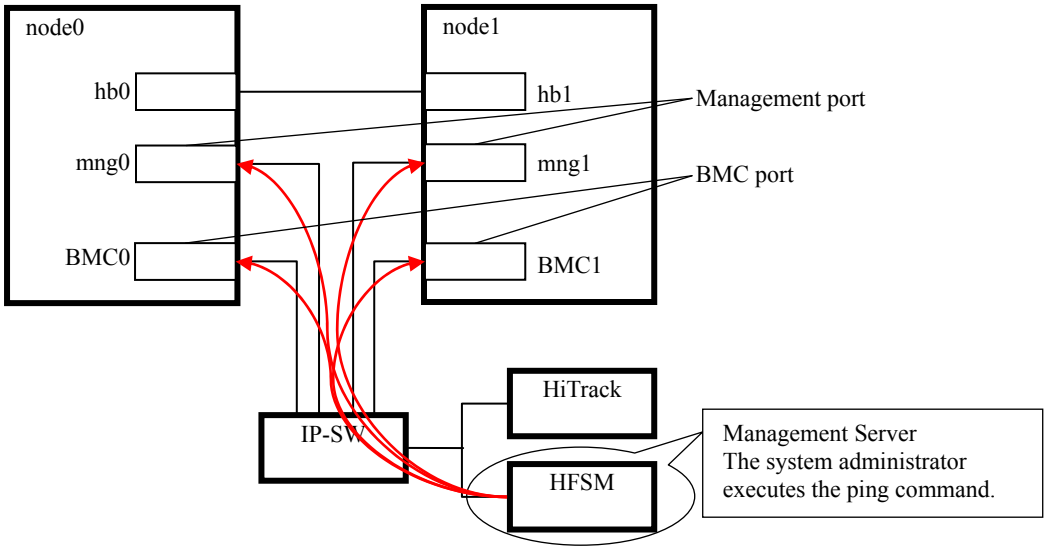

Figure C.2.3.2.1-1 Overview of Checking by Using ping Command

Perform the failure determination operation based on the ping command execution result by referring to ‘Table C.2.3.2.1-1 Matrix Table of Management Network Failures’ below.

The determination operation is the same for the case where the Y/N judgment for node0 and node1 is reversed.

If there is no management network failure and the all results of the Y/N judgment for node 0 and node 1 are “Y”, return to the calling process.

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Table C.2.3.2.1-1 Matrix Table of Management Network Failures

#	Management port		BMC port		OS operation status (*1)	Resource group operation status	Assumed failure	Failure determination procedure
	node0	node1	node0	node1				
1	Y	Y	N	N	Both nodes are in operation	Operating in both nodes (Online/No error)	Double failures in the BMC ports or the cables occurred.	Execute the flow of Figure C.2.3.2.2-1. 'C.2.3.2.2 Flow of management network failure determination (1) Failure in the BMC ports or the cables'
2	Y	Y	Y	N	Both nodes are in operation	Operating in both nodes (Online/No error)	A failure in the BMC ports or the cables occurred.	
3	Y	N	Y	Y	Both nodes are in operation	Operating in one side node (Online/No error)	Failover (*2) occurred due to a failure in the management port or in the cables.	Execute the flow of Figure C.2.3.2.2-2. 'C.2.3.2.2 Flow of management network failure determination (2) Failure in the management port or the cables'
						Stopping resource groups in both nodes (The status is srmd executable error)	The resource groups of the both nodes are stopped abnormally because a failure occurs on the maintenance port or the cable, and then restarting is occurred on the other side node.	
					Only one node is in operation	Operating in one side node (Online/No error)	Reset has been issued due to OS down, and then the failover (*2) has occurred.	'C.2.3.4 Determining the node failure when failover occurred'
4	Y	N	Y	N	—	—	Double or more failures in the ports or the cables have occurred.	Refer to 'Table C.2.3.2.1-2 Failure Status (Determination of Multiple Failures of #4 through #6) (1/2)' and execute the appropriate determination process for failures because the multiple failures might be occurred.
5	Y	N	N	Y	—	—	Double or more failures in the ports or the cables occurred.	
6	N	N	Y	Y	—	—	A wrong setting of the management port IP address, both nodes' operating systems down, double or more failures in the ports and the cables, or a failure on the disk array subsystem occurred.	
7	N	N	N	N	Both nodes are in operation	Operating in both nodes (Online/No error)	A failure in the management IP-SW occurred.	Execute the flow of Figure C.2.3.2.2-10. 'C.2.3.2.2 Flow of management network failure determination (10) Failure in the management IP-SW'

Y: ping response is returned, N: ping response is not returned

*1: Check the logon prompt indication by connecting KVM. In the node displaying the logon prompt, the OS is in operation. By switching the logon prompt confirmation window in each node, the state of both nodes operation can be checked.
For the KVM connection, refer to "Set Up '1.2 Confirmation of KVM Connection' (SETUP 01-0010)" and for the OS operation status, refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)".

*2: When the failover is completed, "Running node" of the both resource groups becomes the same node name. For the details about "Running node", refer to "Maintenance Tool '2.2 Displaying the Cluster Status (clstatus)' (MNTT 02-0040)".

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Table C.2.3.2.1-2 Failure Status (Determination of Multiple Failures of #4 through #6) (1/2)

Item number in Table C.2.3.2.1-1	Condition for determination		Details of failure	Recovery operation	Failure determination procedure (*3)
	Failover completion (*1)	OS operation status (*2)			
4	Y	Both nodes are in operation	Failures have occurred in the management port/cable, BMC port/cable of the same nodes.	The OS service is continued to perform failover when a trouble occurs on the maintenance port. Replace the failed part.	Execute the flow of Figure C.2.3.2.2-3
	Y	Only one node is in operation	Failures of OS down and of BMC port/cable have occurred on the same node.	The OS service is continued. However terminate the service on the failure side, and then replace the failed part.	Execute the flow of Figure C.2.3.2.2-4
5	Y	Both nodes are in operation	① A failure has occurred in the BMC port/cable. ② A failure has occurred also in the management port/cable of the other node.	Perform the management port recovery operation first, because if you perform the BMC port recovery operation first, the node in normal service must be terminated.	Execute the flow of Figure C.2.3.2.2-5
	Y	Only one node is in operation	① Reset has been issued due to OS down, and the failover is being executed. ② A failure has occurred in the BMC port/cable of the other node.	Perform the replacement operation for the OS downed node first, because if you perform the replacement operation for the BMC port first, the node which can be failed over will not exist.	Execute the flow of Figure C.2.3.2.2-6

*1: Failover completed: Y, Failover not completed: N.
When the failover is completed, "Running node" of the both resource groups becomes the same node name. For the details about "Running node", refer to "Maintenance Tool '2.2 Displaying the Cluster Status (clstatus)' (MNTT 02-0040)".

*2: Check the logon prompt indication by connecting KVM. In the node displaying the logon prompt, the OS is in operation. By switching the logon prompt confirmation window in each node, the state of both nodes operation can be checked.
For the KVM connection, refer to "Set Up '1.2 Confirmation of KVM Connection' (SETUP 01-0010)" and for the OS operation status, refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)".

*3: For the failure determination procedures, follow 'C.2.3.2.2 Flow of management network failure determination'.

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Table 2.3.2.1-2 Failure Status (Determination of Multiple Failures of #4 through #6) (2/2)

Item number in Table C.2.3.2.1-1	Condition for determination			Details of failure	Recovery operation	Failure determination procedure (*3)
	Failover completion (*1)	OS operation status (*2)	Resource group operation status			
6	Y or N	Both nodes are in operation	Both nodes are in operation (Online/No error)	Failures have occurred in the management port/cable of the both nodes. (*4)	As the communication is enabled via the heartbeat cable, the OS service is continued. Execute the replacement operation for each node one by one by terminating it by manual failover.	Execute the flow of Figure C.2.3.2.2-7
	Y	Only one node is in operation	Only one node is in operation (Online/No error)	① Reset has been issued due to the OS outage, and the failover is being executed. ② After the failover completion, a failure has occurred in the management port/cable of the other node.	As the OS service is continued by the failover, execute the replacement operation by terminating the node of failed OS.	Execute the flow of Figure C.2.3.2.2-8
	Y	Only one node is in operation	Resource groups of both nodes terminated (Error status is srmd executable error)	After a failure occurred on the side of the maintenance port and failover is executed, a failure of the service termination on both nodes occurred due to OS down on the other side node.	Terminate the node that failed, and recover it.	Execute the flow of Figure C.2.3.2.2-8
	N	No node is in operation	Command cannot be executed because no node is in operation.	OS double failures have occurred.	Execute checking by using the diagnostic tool of the hardware vendor. Check also the Disk Array Subsystem.	Execute the flow of Figure C.2.3.2.2-9

*1: Failover completed: Y, Failover not completed: N.
When the failover is complete, "Running node" of the both resource groups becomes the same node name. For the details about "Running node", refer to "Maintenance Tool '2.2 Displaying the Cluster Status (clstatus)' (MNTT 02-0040)".

*2: Check the logon prompt indication by connecting KVM. In the node of which the logon prompt is displayed, the OS is in operation. By switching the logon prompt confirmation window in each node, the state of both nodes operation can be checked.
For the KVM connection, refer to "Set Up '1.2 Confirmation of KVM Connection' (SETUP 01-0010)" and for the OS operation status, refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)".

*3: For the failure determination procedures, follow 'C.2.3.2.2 Flow of management network failure determination'.

*4: There is a case that Failover does not occur, and a case that Failover has completed. Failover does not occur when a case that the maintenance ports of the both nodes have failed at the same time.

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C.2.3.2.2 Flow of management network failure determination

In this section, perform the operation of the management network failure determination based on the execution result of the ping command executed in Section C.2.3.2.1.

Execute the failure determination flow by following "Table C.2.3.2.1-1 Matrix of Management Network Failures" or "Table C.2.3.2.1-2 Failure Status (Determination of Multiple Failures of #4 through #6)".

(1) Failure in the BMC ports or the cables

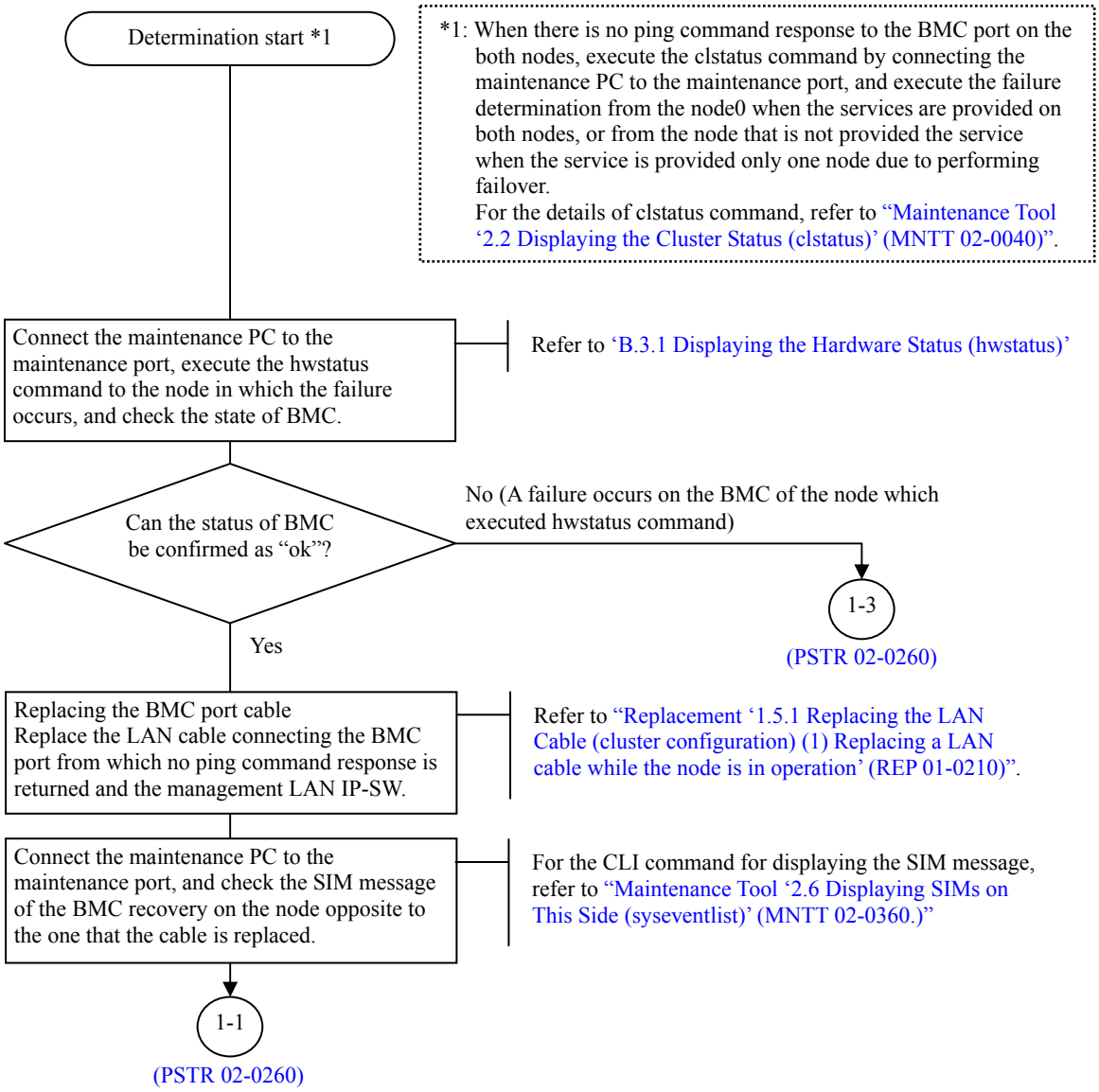

Figure C.2.3.2.2-1 Flow of Management Network Failure Determination (1/6)

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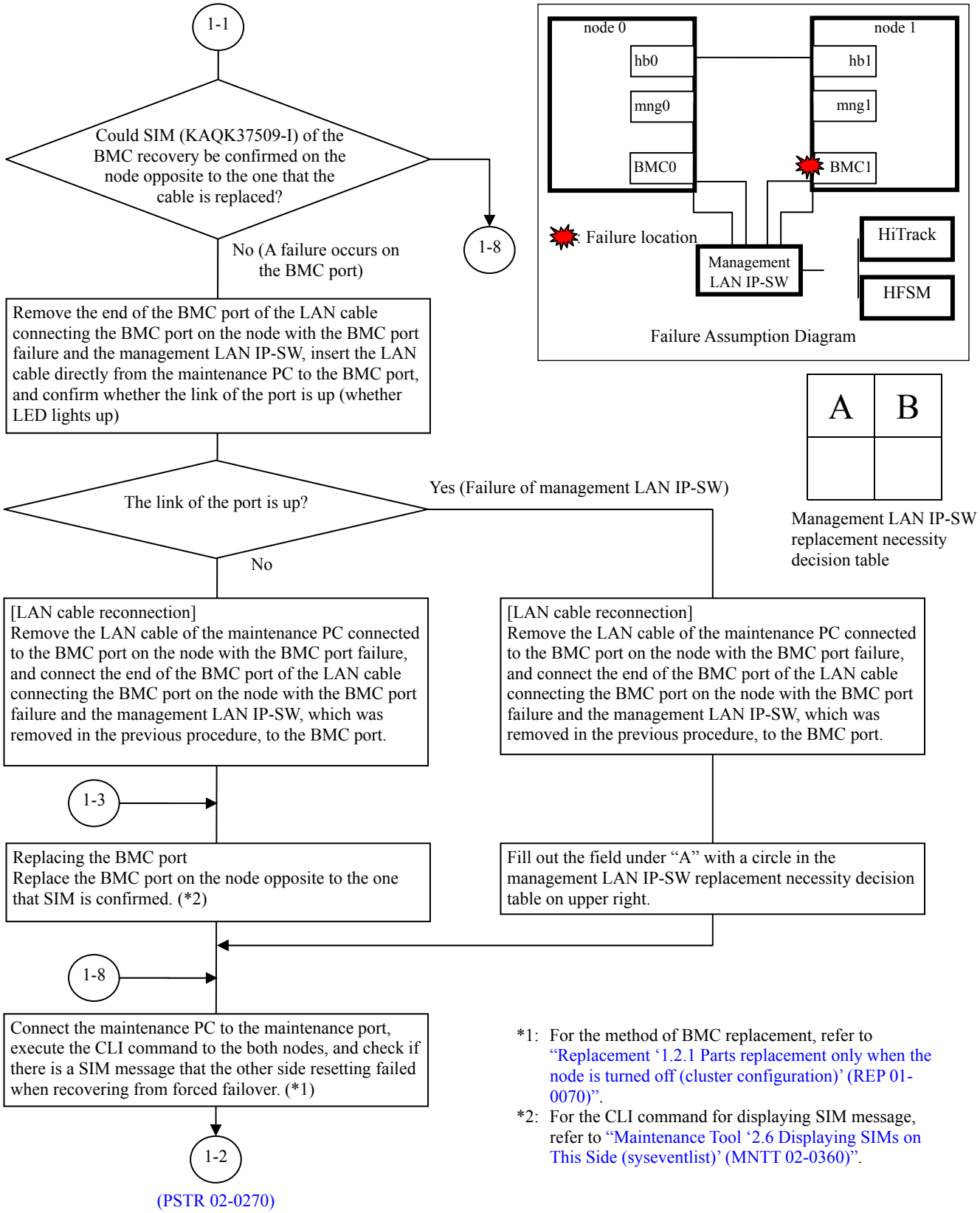

Figure C.2.3.2.2-1 Flow of Management Network Failure Determination (2/6)

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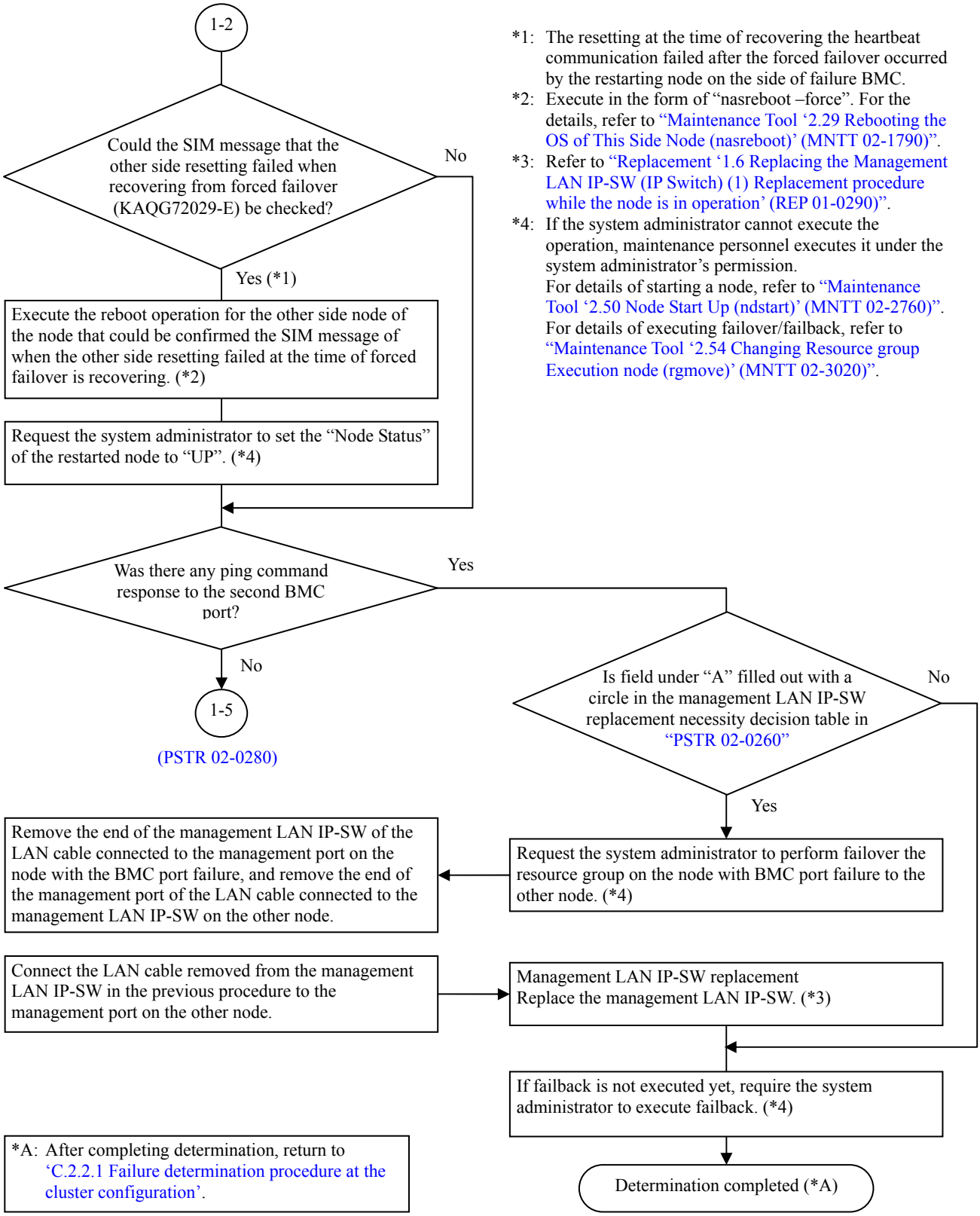

*1: The resetting at the time of recovering the heartbeat communication failed after the forced failover occurred by the restarting node on the side of failure BMC.

*2: Execute in the form of "nasreboot –force". For the details, refer to "Maintenance Tool '2.29 Rebooting the OS of This Side Node (nasreboot)' (MNTT 02-1790)".

*3: Refer to "Replacement '1.6 Replacing the Management LAN IP-SW (IP Switch) (1) Replacement procedure while the node is in operation' (REP 01-0290)".

*4: If the system administrator cannot execute the operation, maintenance personnel executes it under the system administrator's permission.
For details of starting a node, refer to "Maintenance Tool '2.50 Node Start Up (ndstart)' (MNTT 02-2760)".
For details of executing failover/failback, refer to "Maintenance Tool '2.54 Changing Resource group Execution node (rgmove)' (MNTT 02-3020)".

*A: After completing determination, return to 'C.2.2.1 Failure determination procedure at the cluster configuration'.

Figure C.2.3.2.2-1 Flow of Management Network Failure Determination (3/6)

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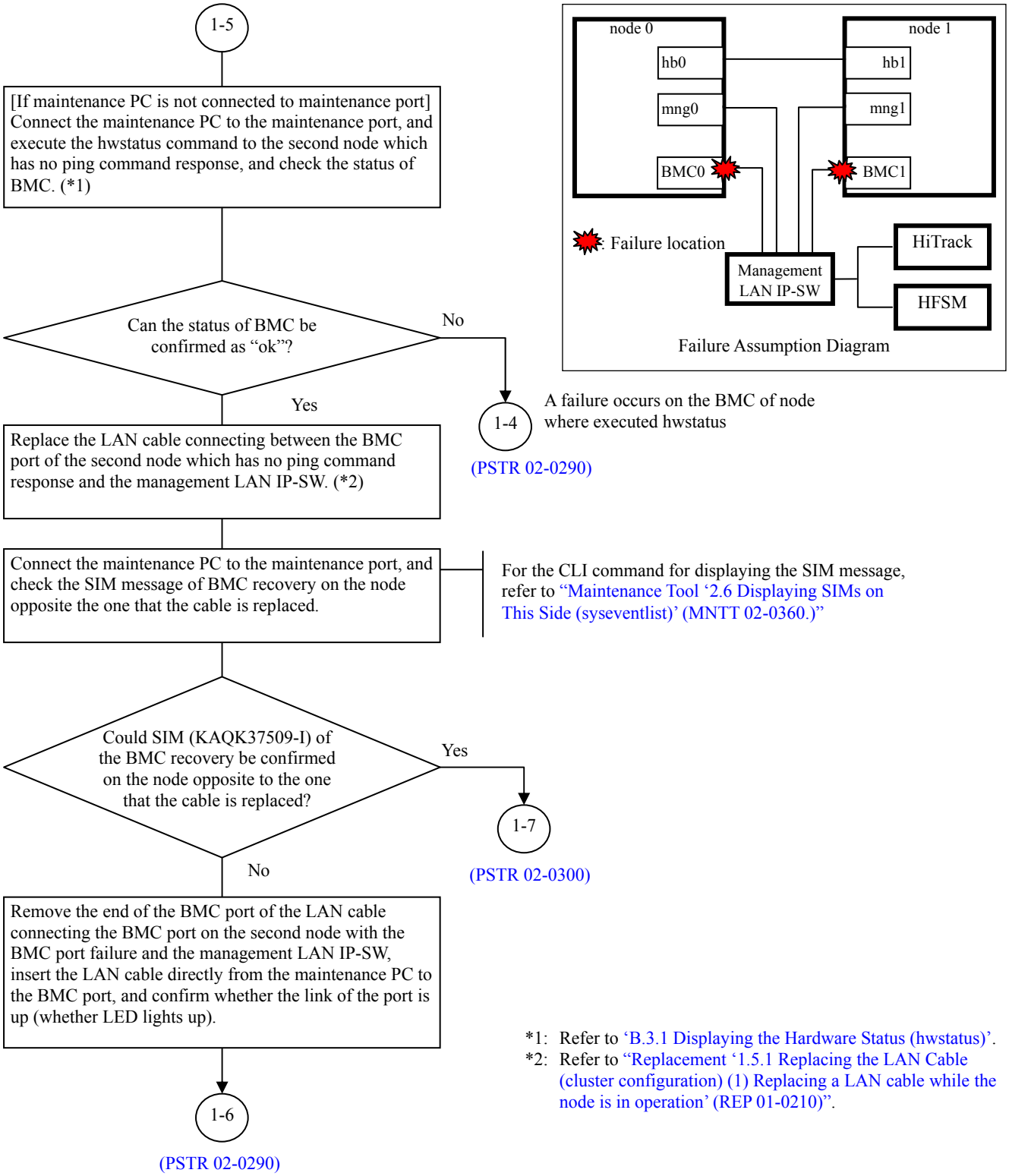

*1: Refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.
*2: Refer to "Replacement '1.5.1 Replacing the LAN Cable (cluster configuration) (1) Replacing a LAN cable while the node is in operation' (REP 01-0210)".

Figure C.2.3.2.2-1 Flow of Management Network Failure Determination (4/6)

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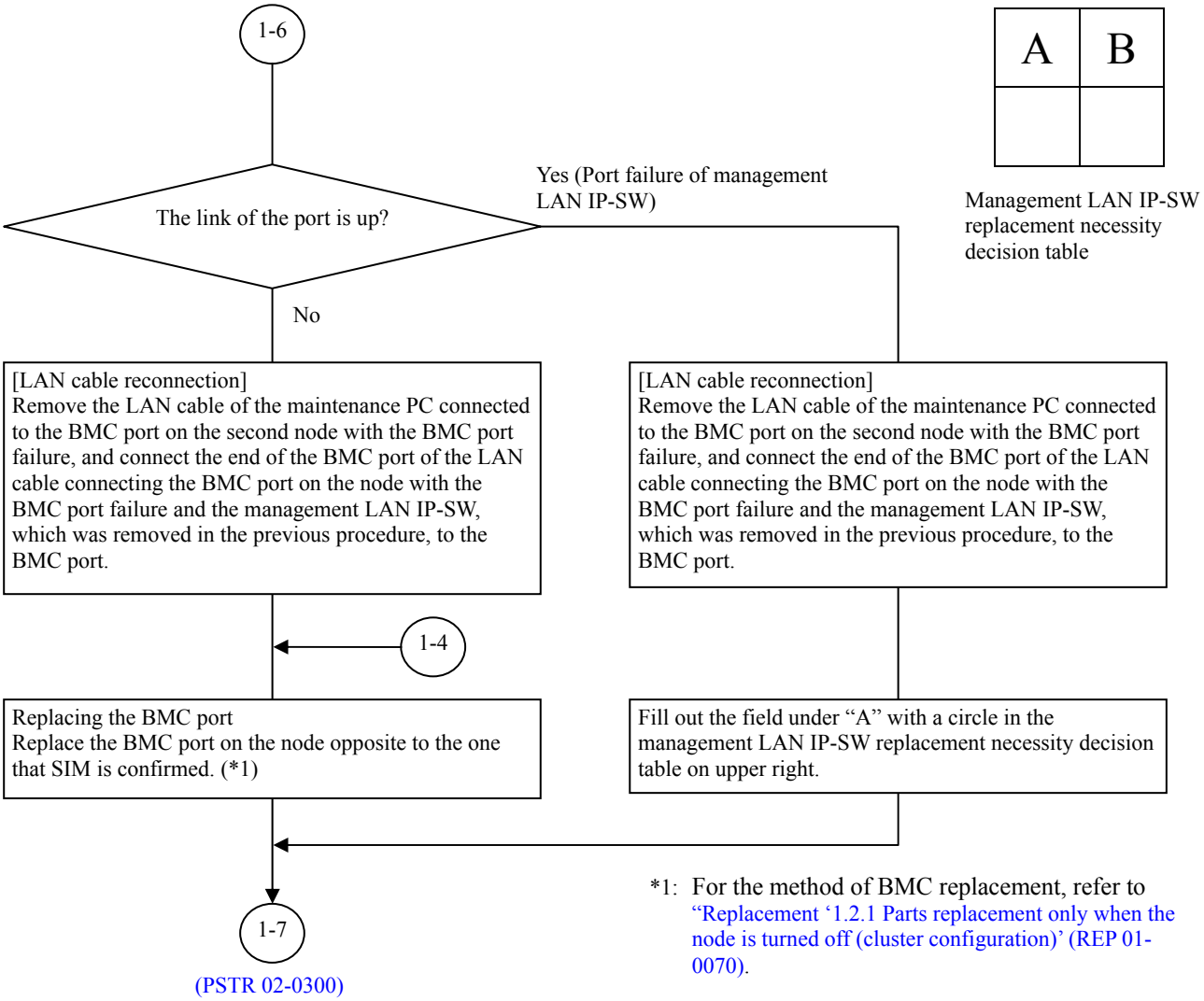

Figure C.2.3.2.2-1 Flow of Management Network Failure Determination (5/6)

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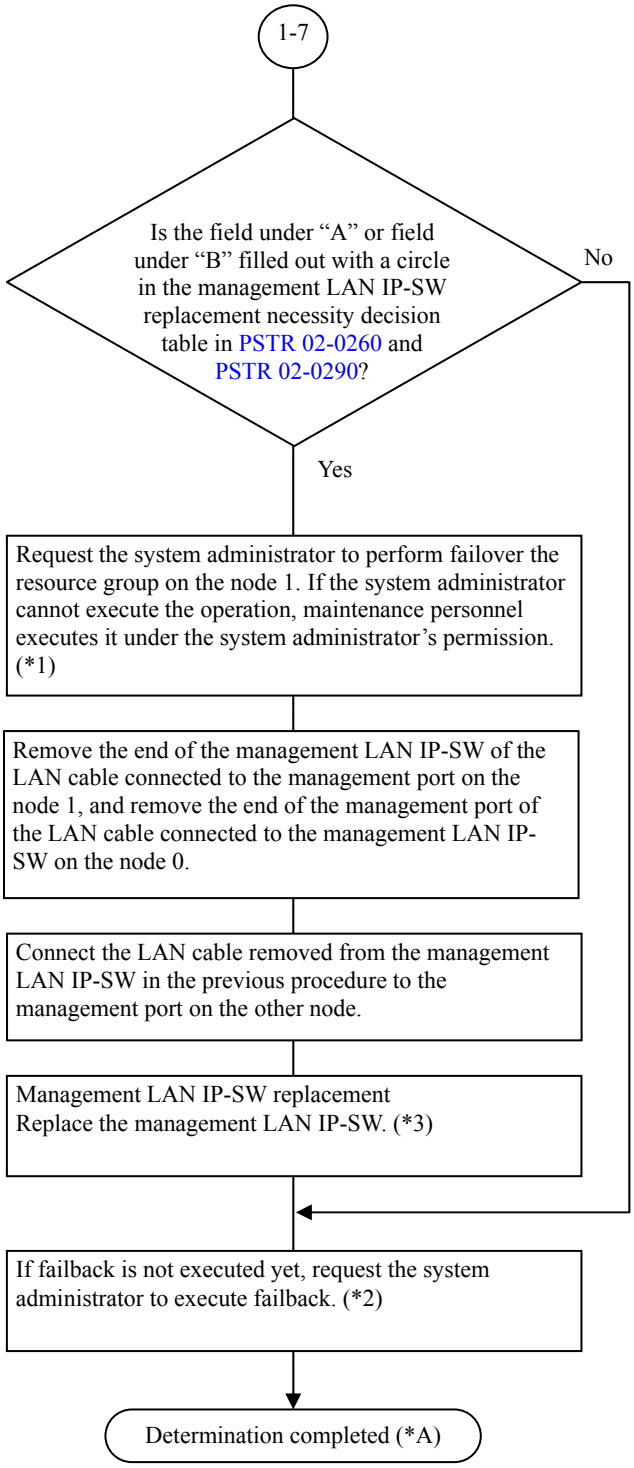

*1: Refer to "Maintenance Tool '2.54 Changing Resource group Execution node (rgmove)' (MNTT 02-3020)".

*2: If the system administrator cannot execute the operation, maintenance personnel executes it under the system administrator's permission.
Refer to "Maintenance Tool '2.54 Changing Resource group Execution node (rgmove) (MNTT 02-3020)".

*3: Refer to "Replacement '1.6 Replacing the Management LAN IP-SW (IP Switch) (1) Replacement procedure while the node is in operation' (REP 01-0290)".

*A: After completing determination, return to 'C.2.2.1 Failure determination procedure at the cluster configuration'.

Figure C.2.3.2.2-1 Flow of Management Network Failure Determination (6/6)

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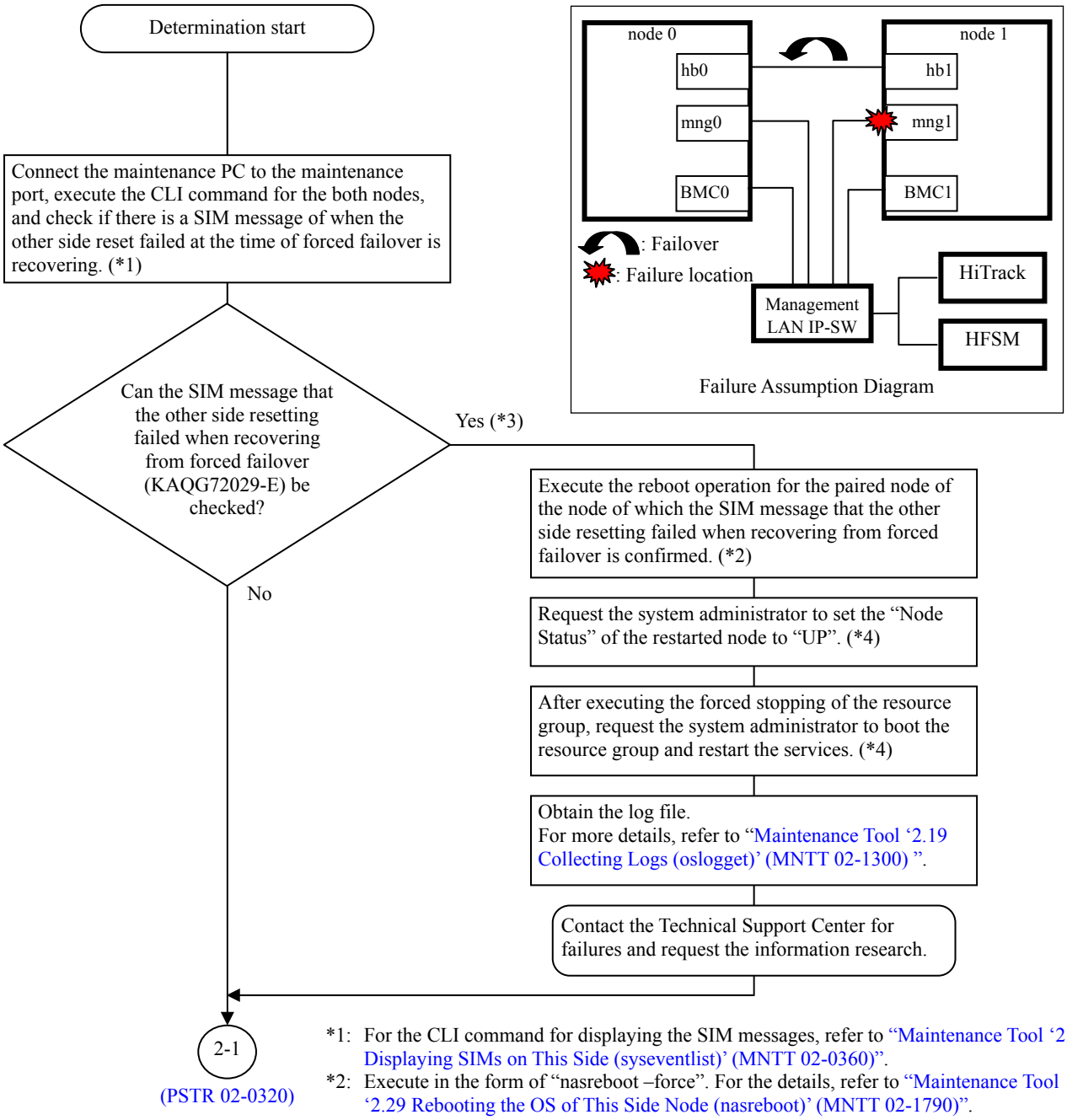
(2) Failure in the management port or the cables



*1: For the CLI command for displaying the SIM messages, refer to "Maintenance Tool '2.6 Displaying SIMs on This Side (syseventlist)' (MNTT 02-0360)".

*2: Execute in the form of "nasreboot –force". For the details, refer to "Maintenance Tool '2.29 Rebooting the OS of This Side Node (nasreboot)' (MNTT 02-1790)".

*3: The resetting at the time of recovering the heartbeat communication failed, after the occurrence of a forced failover by rebooting of node that opposite to the one where a failure occurred on the maintenance port. [srmd executable error] is displayed on the error status of a resource group.

*4: If the system administrator cannot execute the operation, maintenance personnel executes it under the system administrator's permission. For details of starting a node, refer to "Maintenance Tool '2.50 Node Start Up (ndstart)' (MNTT 02-2760)".
For terminating a resource group, refer to "Maintenance Tool '3.3 The Operation Accompanying Forced Stop of the Resource group' (MNTT 03-0060)".

Figure C.2.3.2.2-2 Flow of Management Network Failure Determination (1/2)

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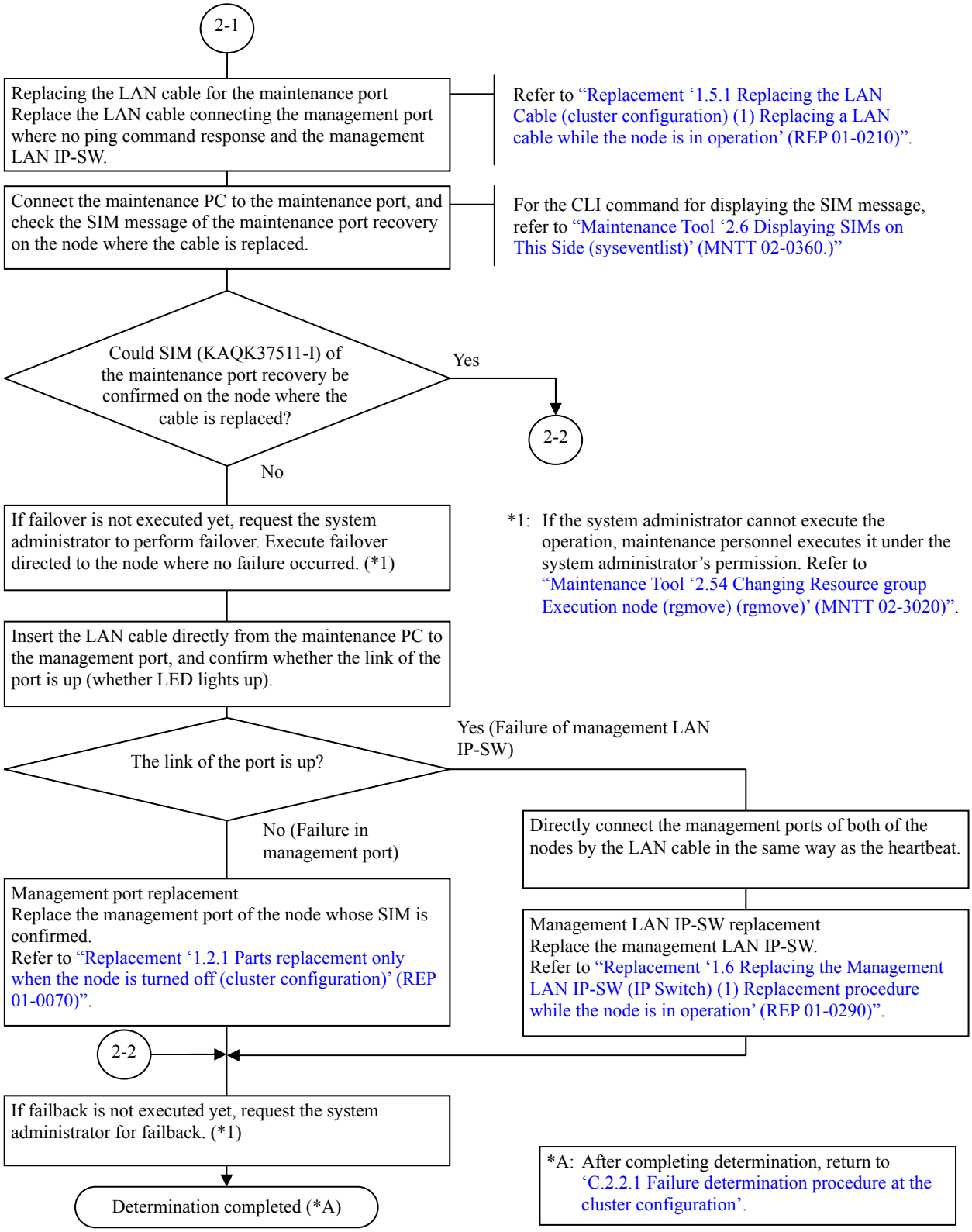

Figure C.2.3.2.2-2 Flow of Management Network Failure Determination (2/2)

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(3) Double failures in the port or cable

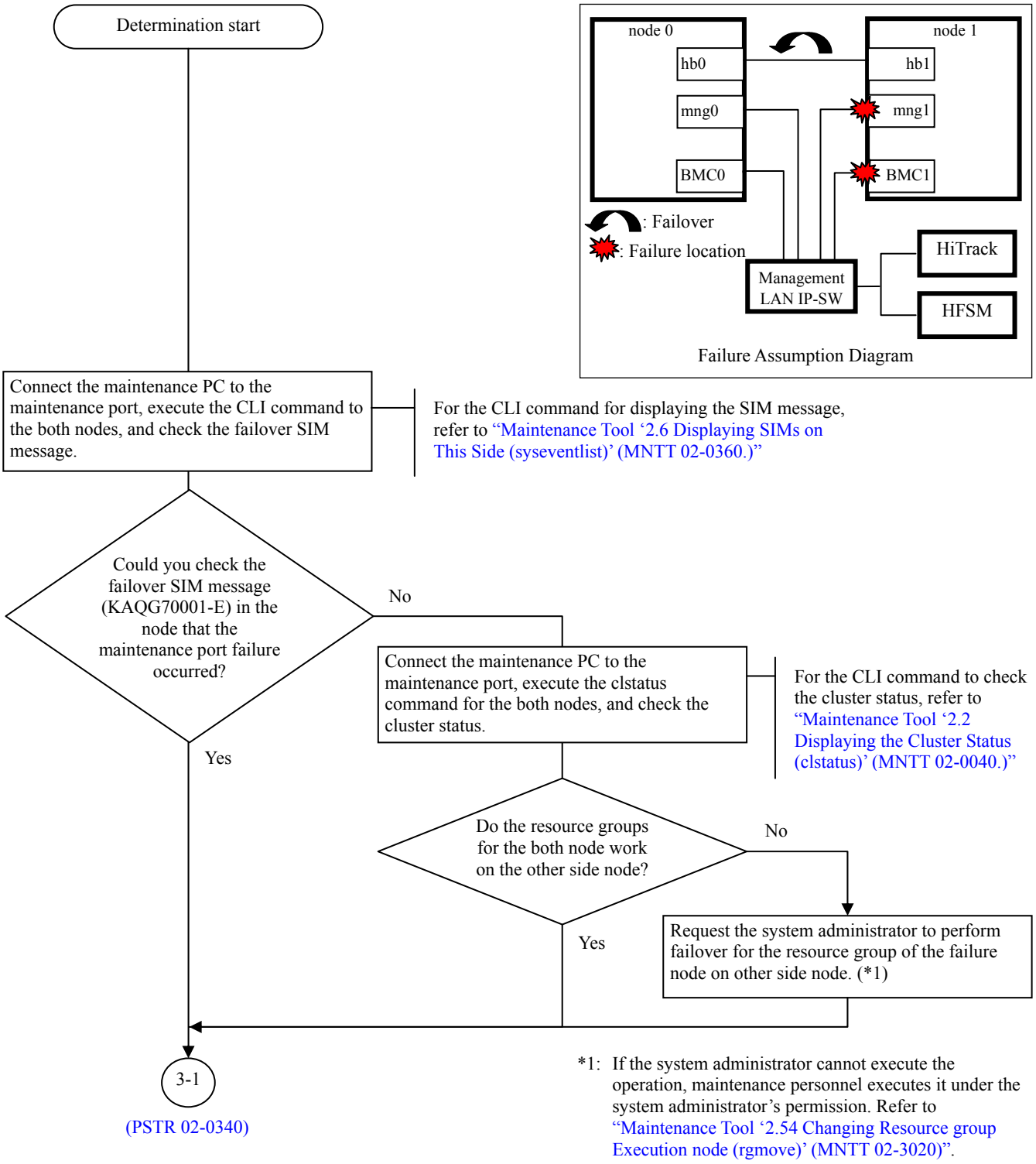

Figure C.2.3.2.2-3 Flow of Management Network Failure Determination (1/5)

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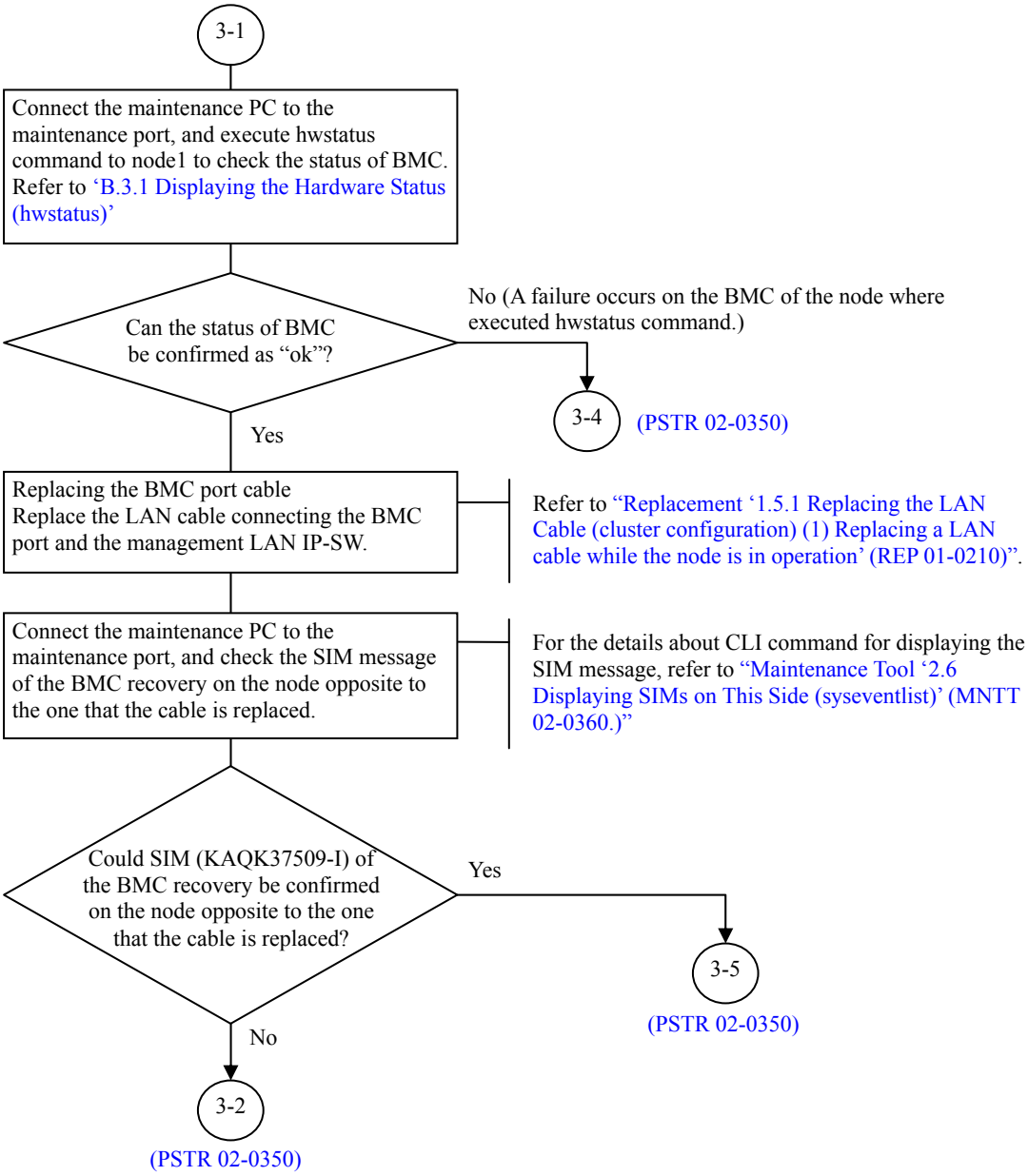

Figure C.2.3.2.2-3 Flow of Management Network Failure Determination (2/5)

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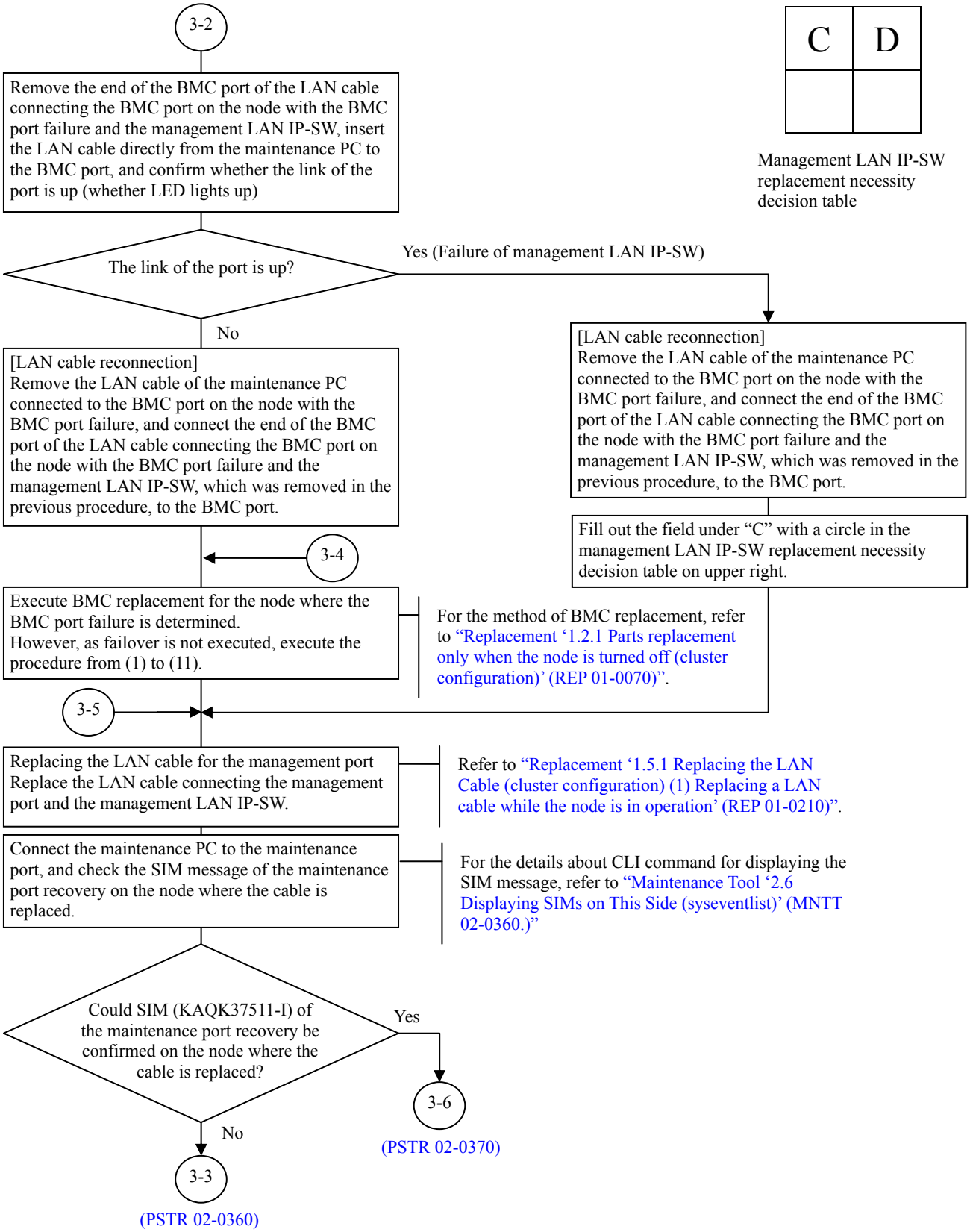

Figure C.2.3.2.2-3 Flow of Management Network Failure Determination (3/5)

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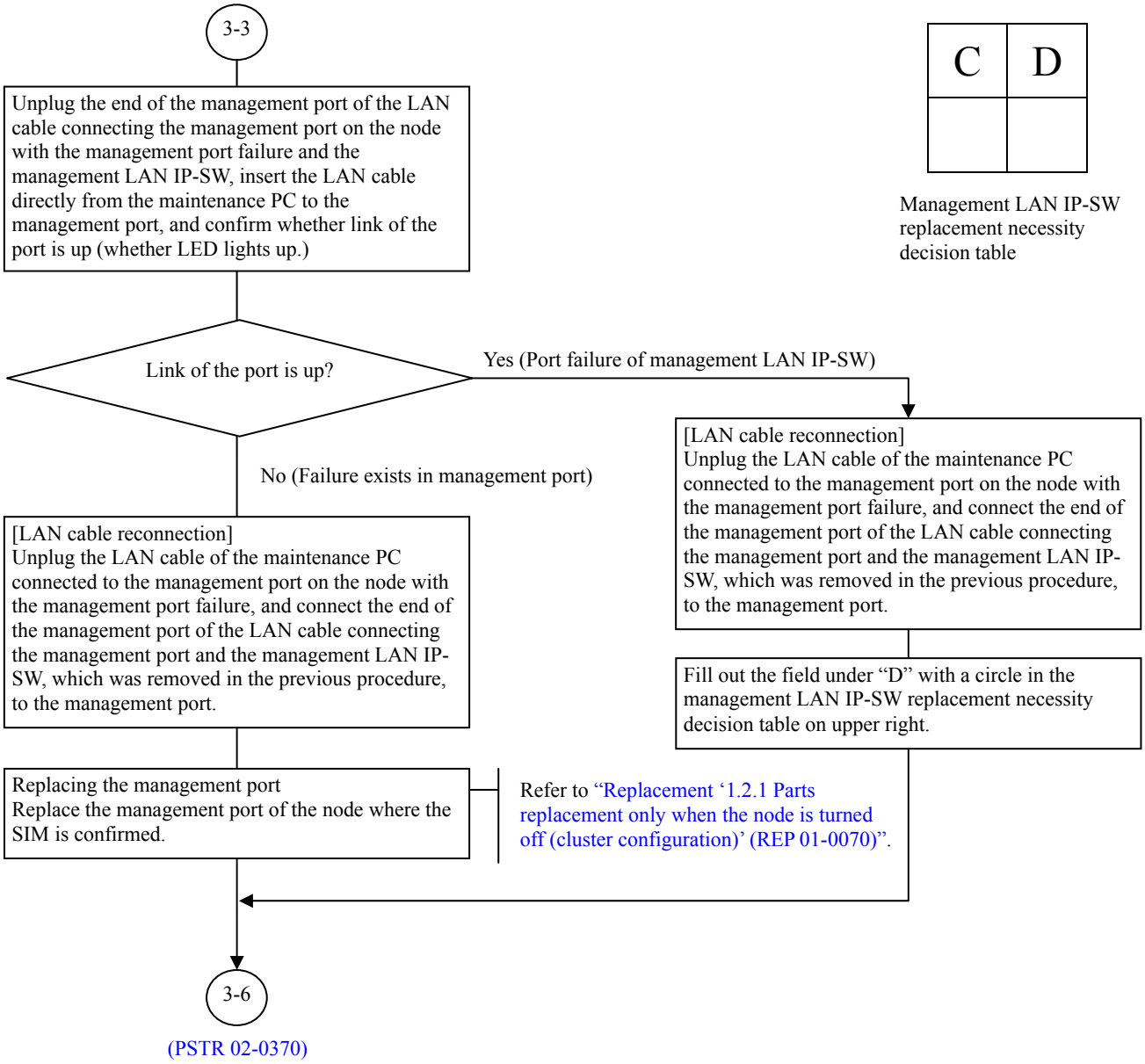

Figure C.2.3.2.2-3 Flow of Management Network Failure Determination (4/5)

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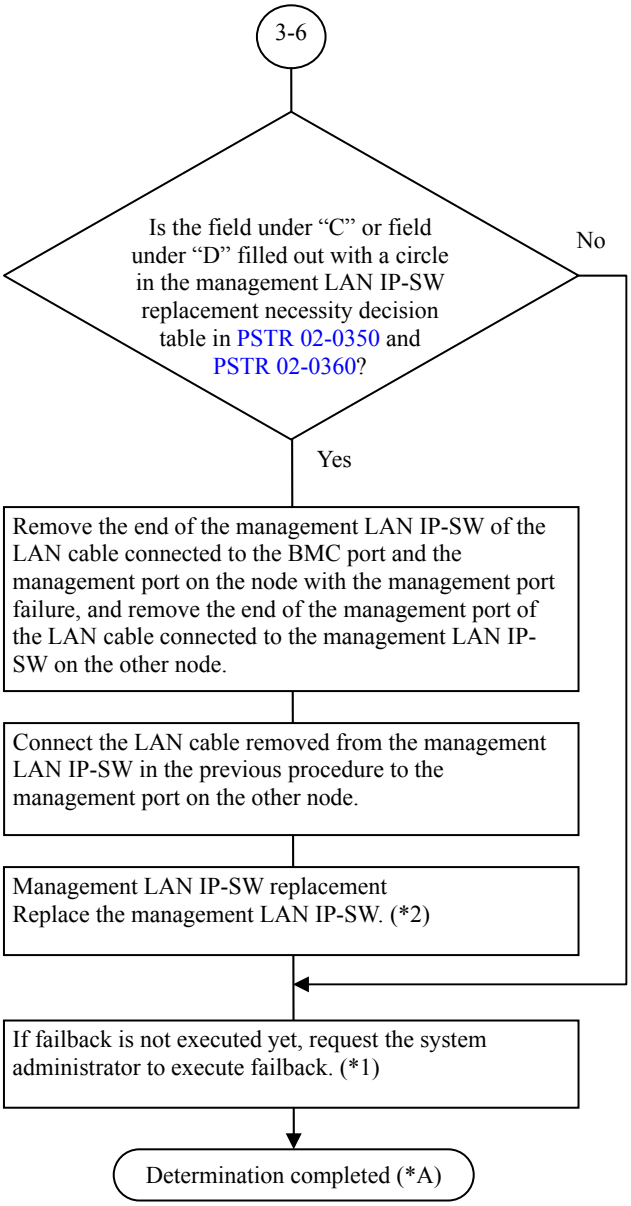

*1: If the system administrator cannot execute the operation, maintenance personnel executes it under the system administrator's permission. refer to "Maintenance Tool '2.54 Changing Resource group Execution node (rgmove)' (MNTT 02-3020)".

*2: Refer to "Replacement '1.6 Replacing the Management LAN IP-SW (IP Switch) (1) Replacement procedure while the node is in operation' (REP 01-0290)".

*A: After completing determination, return to 'C.2.2.1 Failure determination procedure at the cluster configuration'.

Figure C.2.3.2.2-3 Flow of Management Network Failure Determination (5/5)

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(4) OS down and the failure in the BMC port on the same node

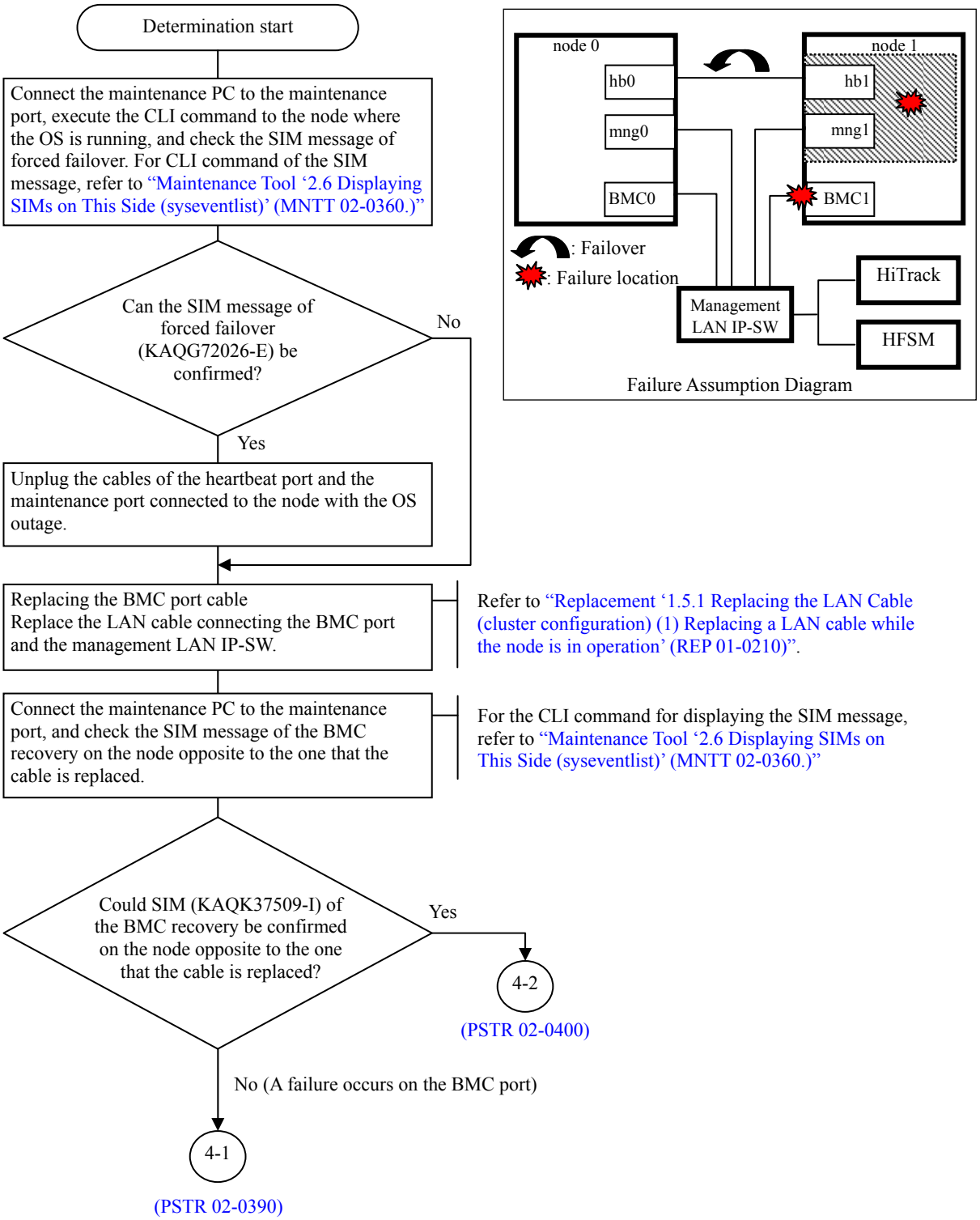

Figure C.2.3.2.2-4 Flow of Management Network Failure Determination (1/8)

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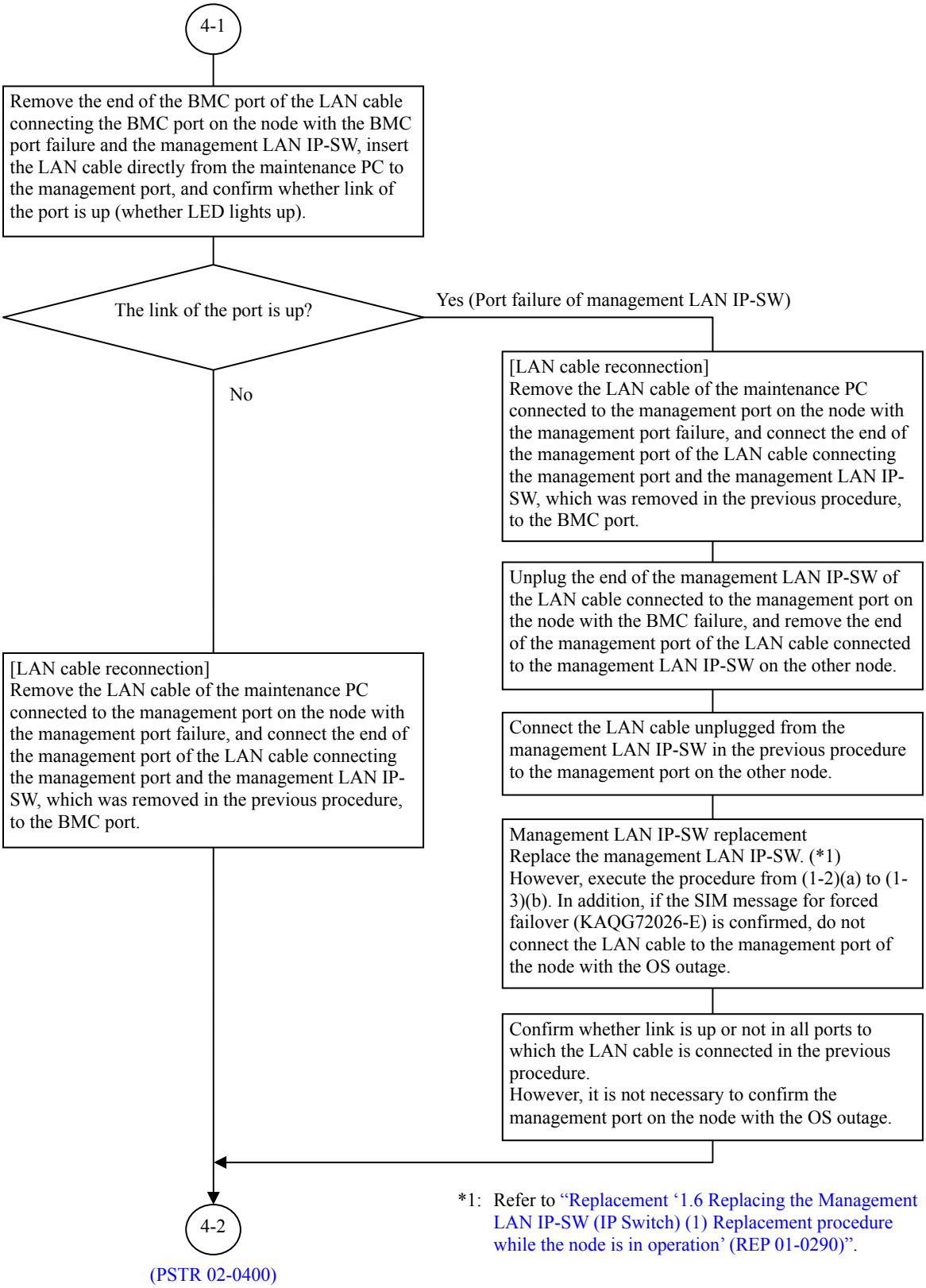

Figure C.2.3.2.2-4 Flow of Management Network Failure Determination (2/8)

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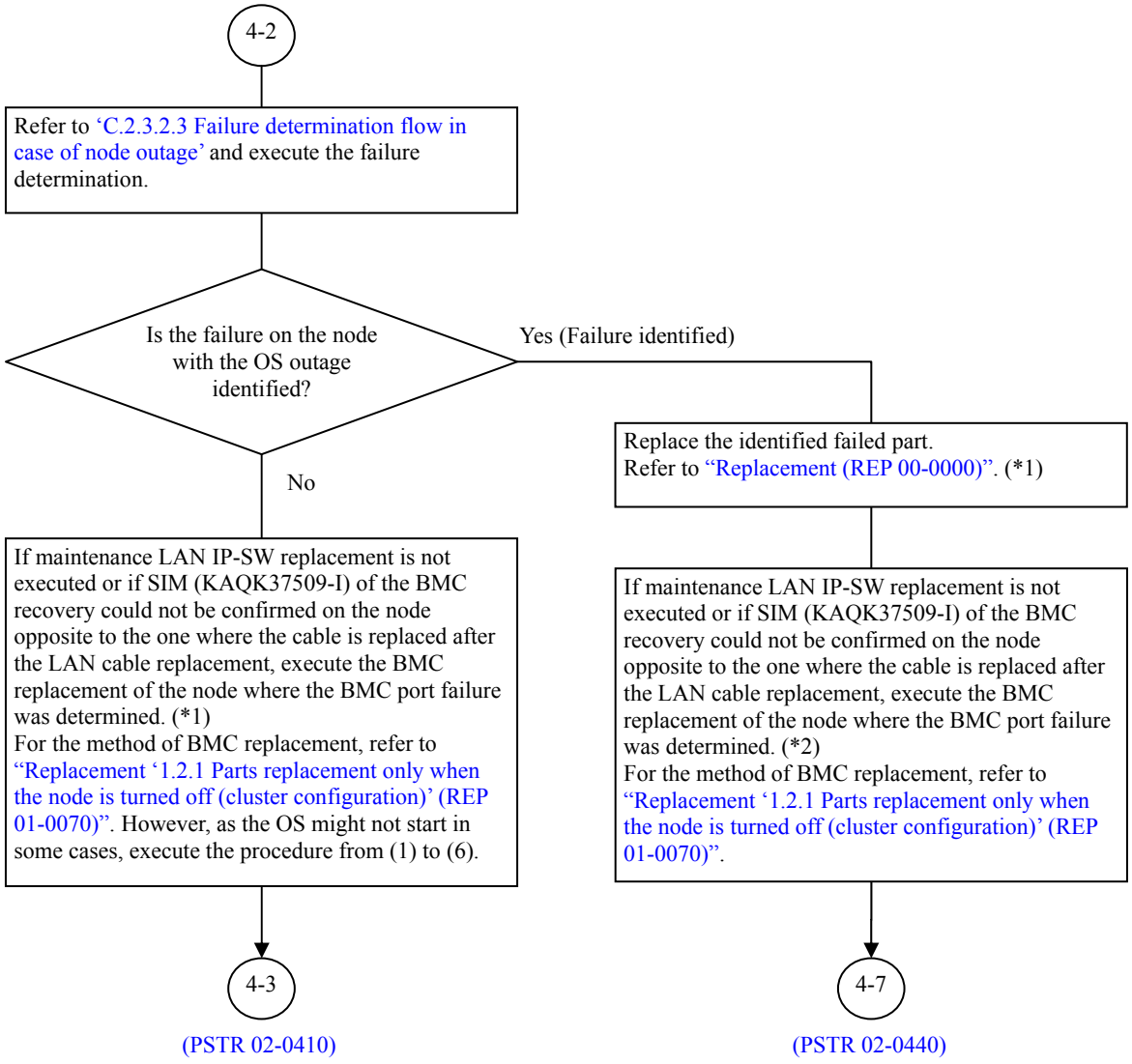

*1: If the heartbeat cable and the management port cable are removed, execute part replacement and confirmation after replacement with the cables removed. In addition, do not request the system administrator for failback.

*2: If BMC replacement is already finished, proceed to the next procedure without executing this procedure.

Figure C.2.3.2.2-4 Flow of Management Network Failure Determination (3/8)

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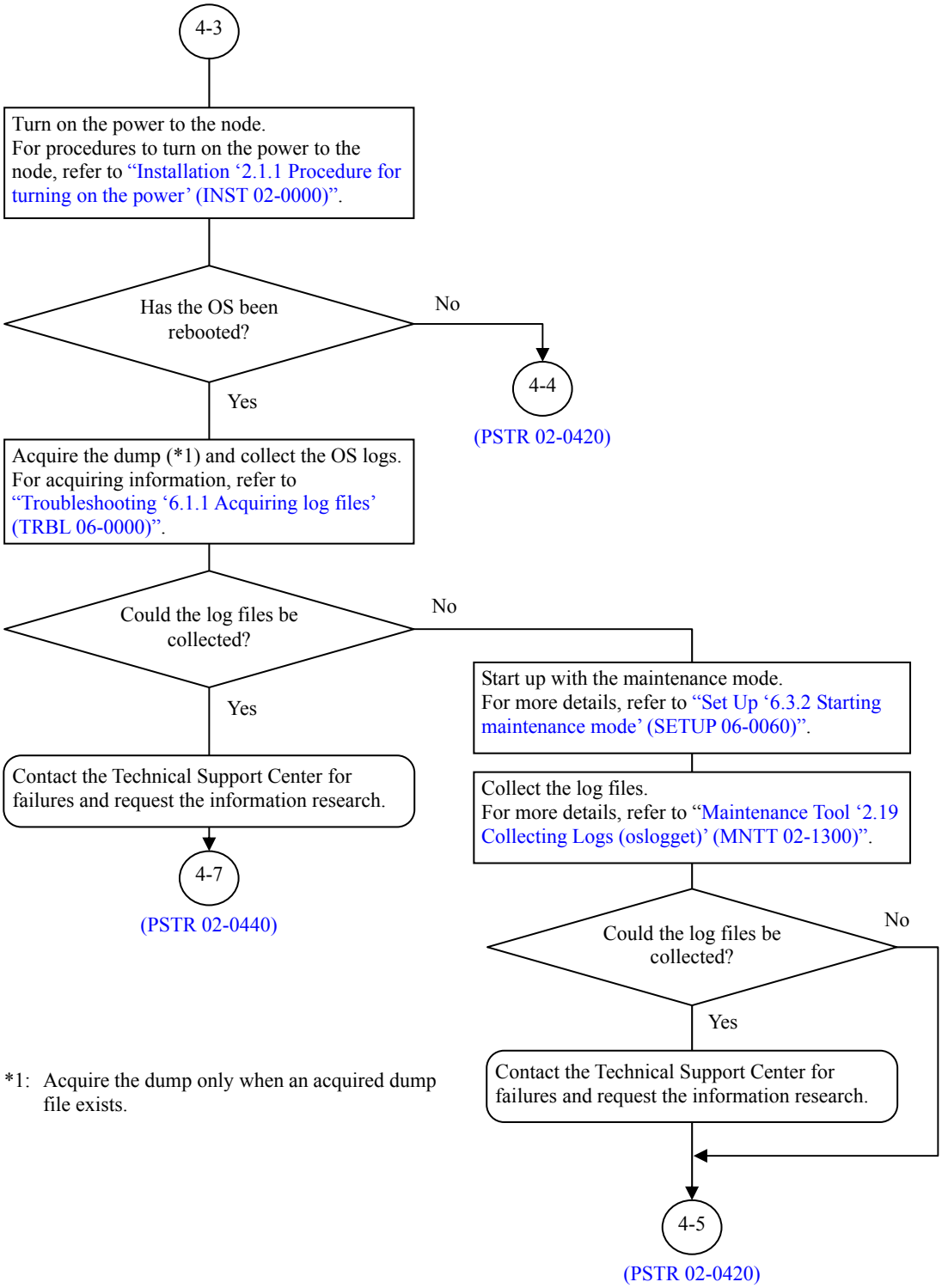

*1: Acquire the dump only when an acquired dump file exists.

Figure C.2.3.2.2-4 Flow of Management Network Failure Determination (4/8)

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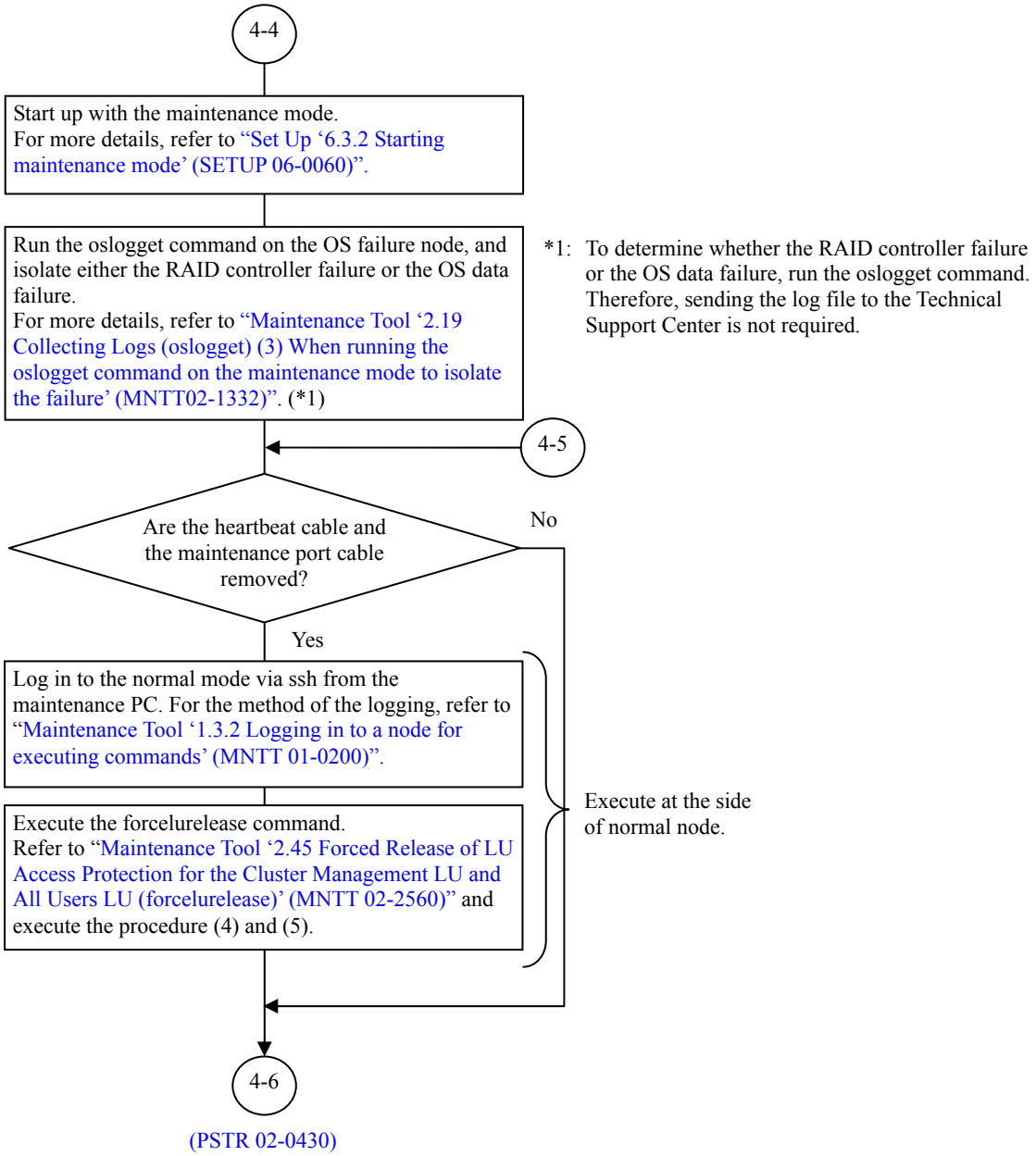

Figure C.2.3.2.2-4 Flow of Management Network Failure Determination (5/8)

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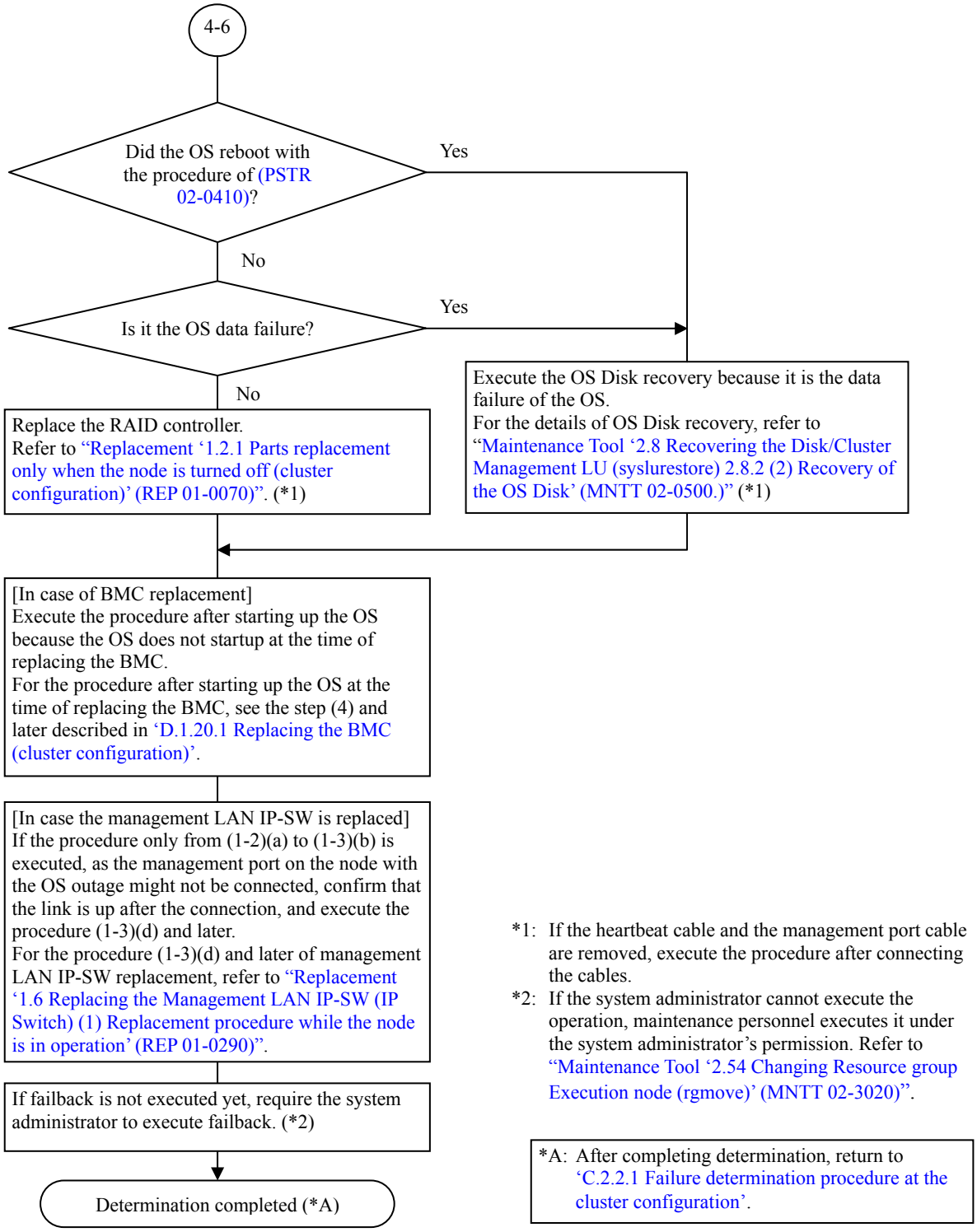

Figure C.2.3.2.2-4 Flow of Management Network Failure Determination (6/8)

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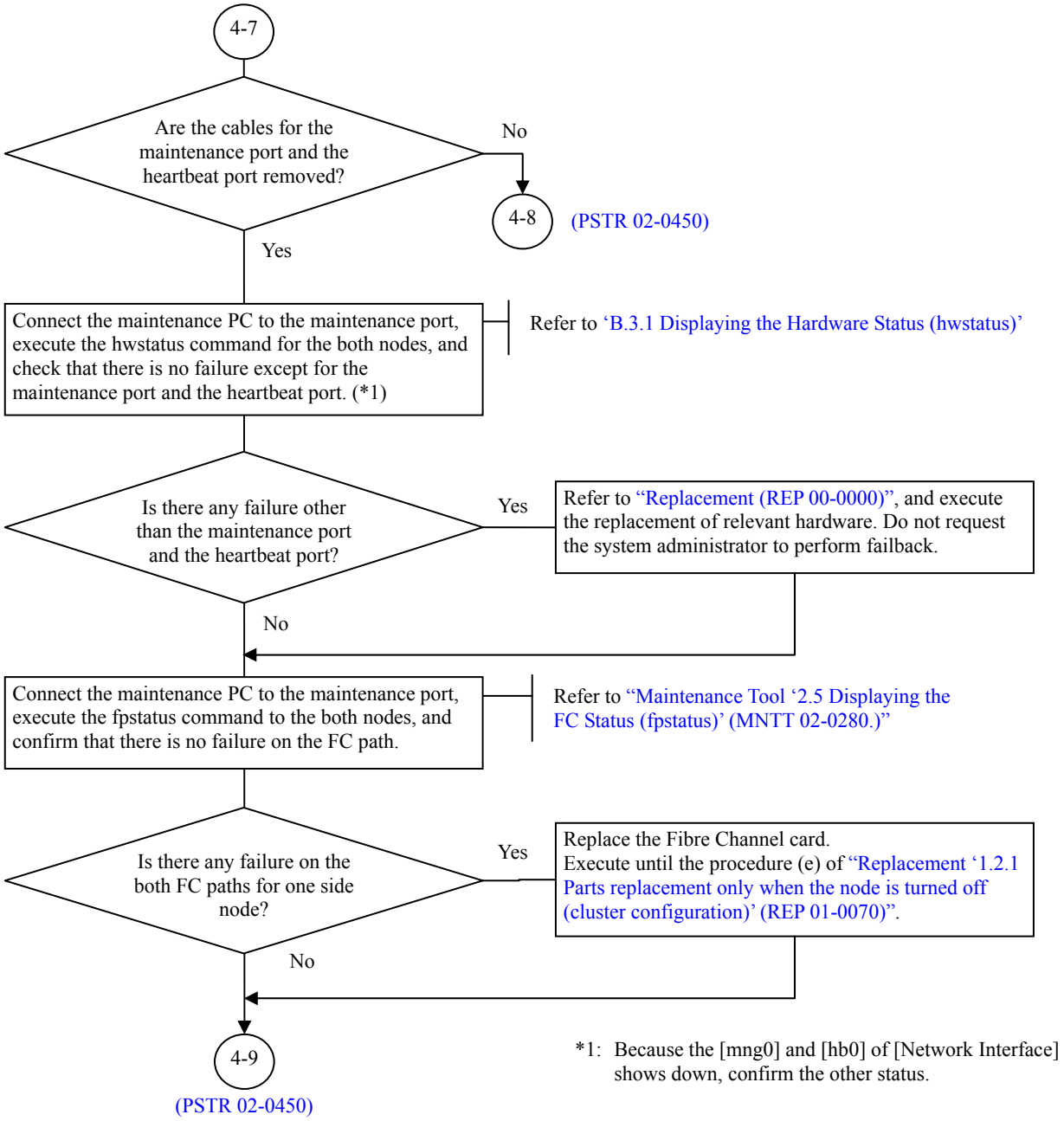

Figure C.2.3.2.2-4 Flow of Management Network Failure Determination (7/8)

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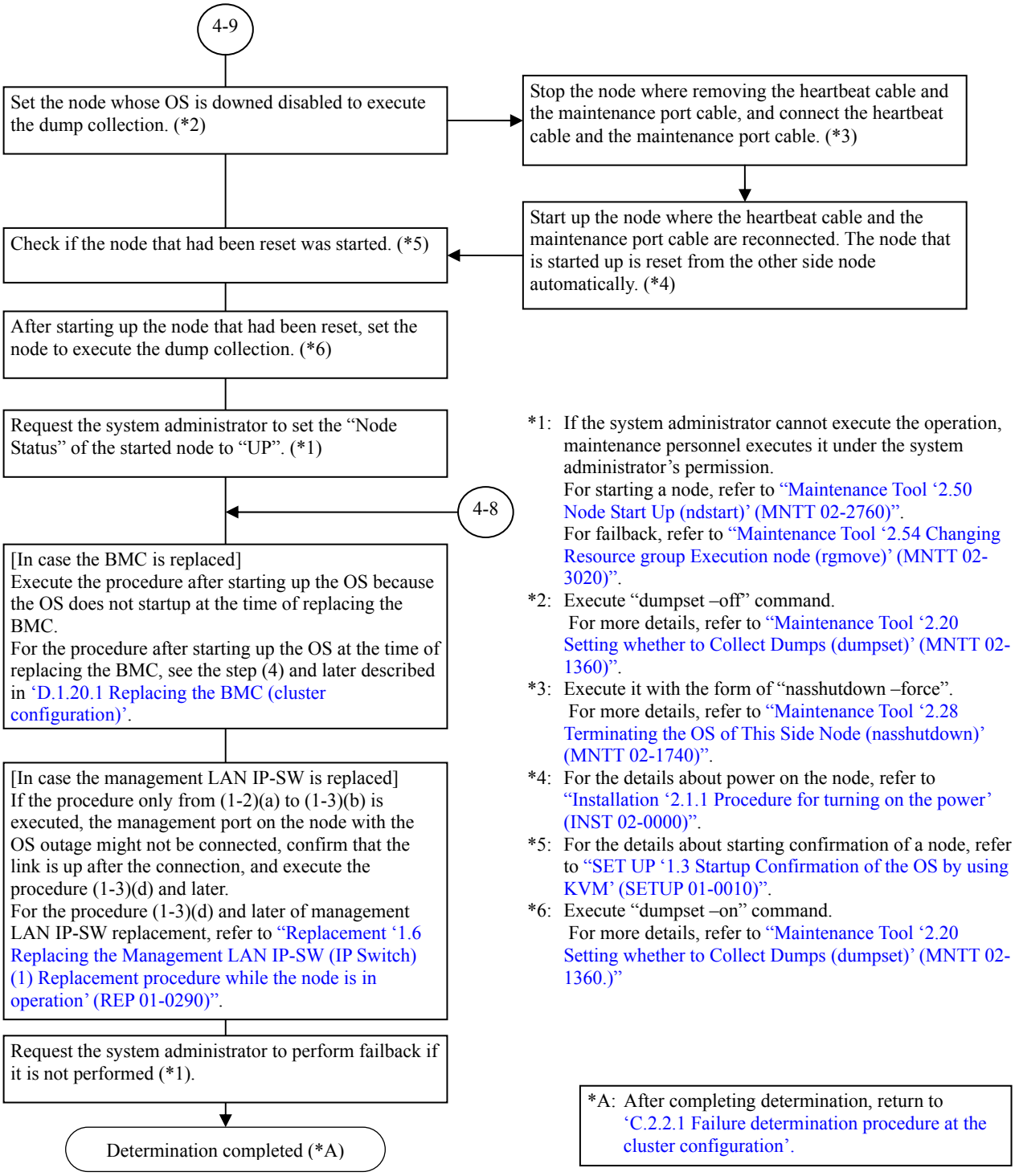

Figure C.2.3.2.2-4 Flow of Management Network Failure Determination (8/8)

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(5) Failure in the BMC port and in the management port of the other node

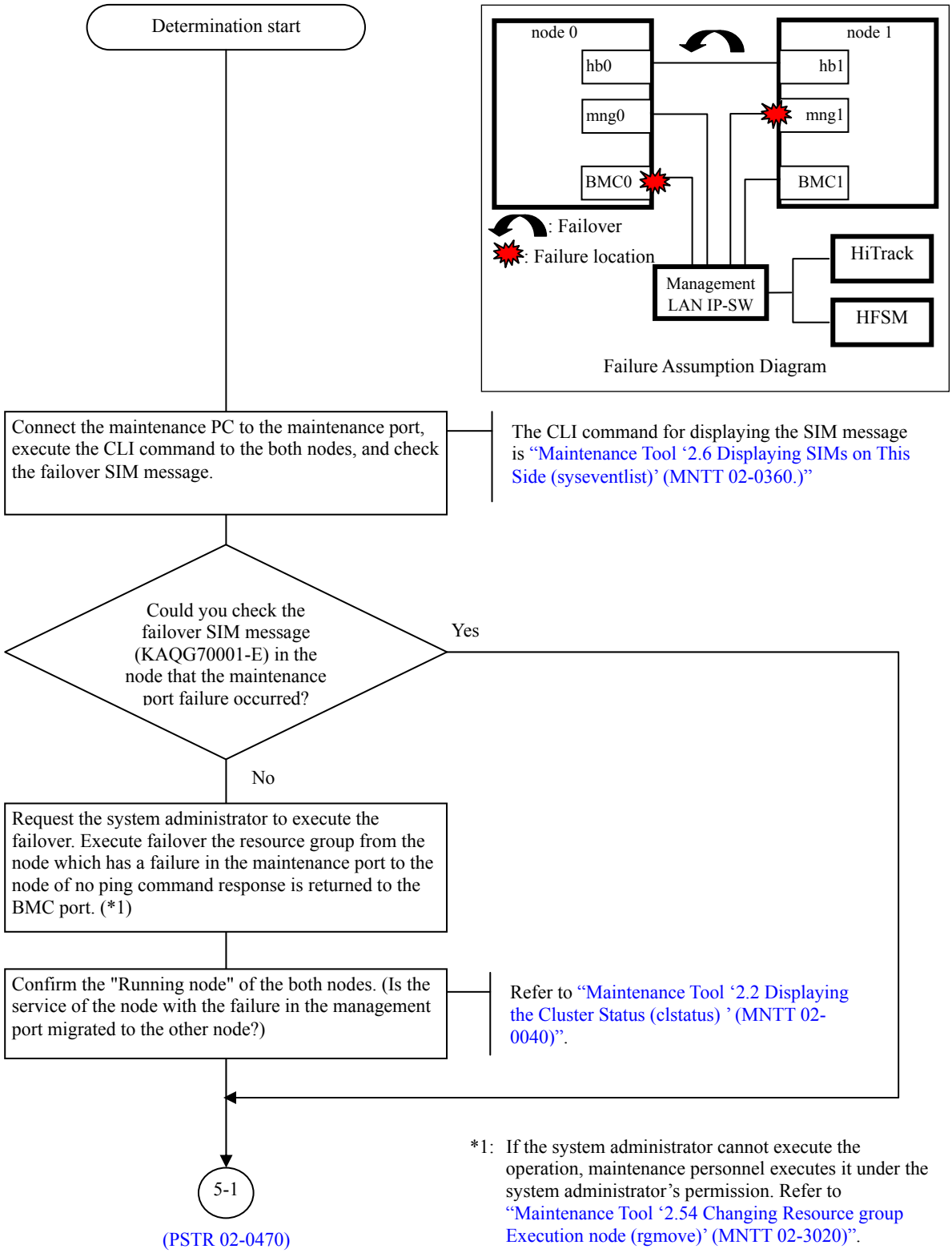

Figure C.2.3.2.2-5 Flow of Management Network Failure Determination (1/6)

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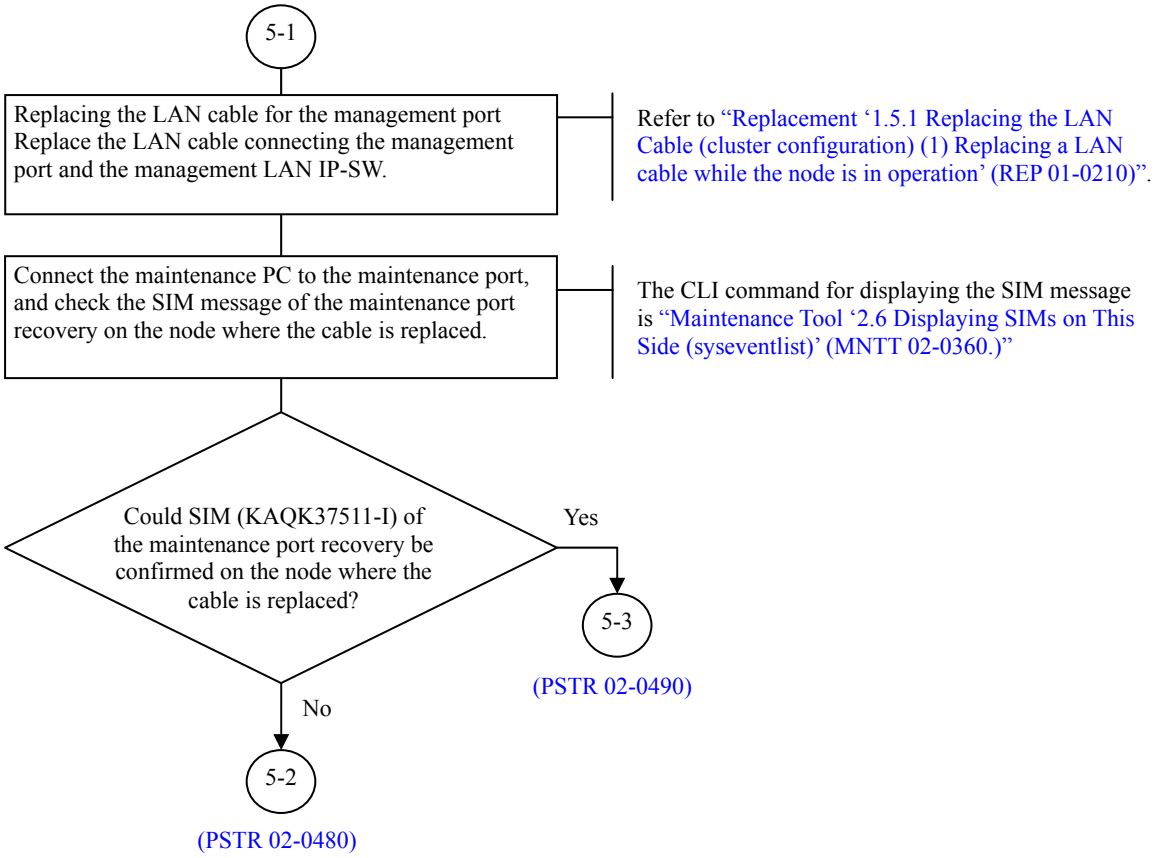

Figure C.2.3.2.2-5 Flow of Management Network Failure Determination (2/6)

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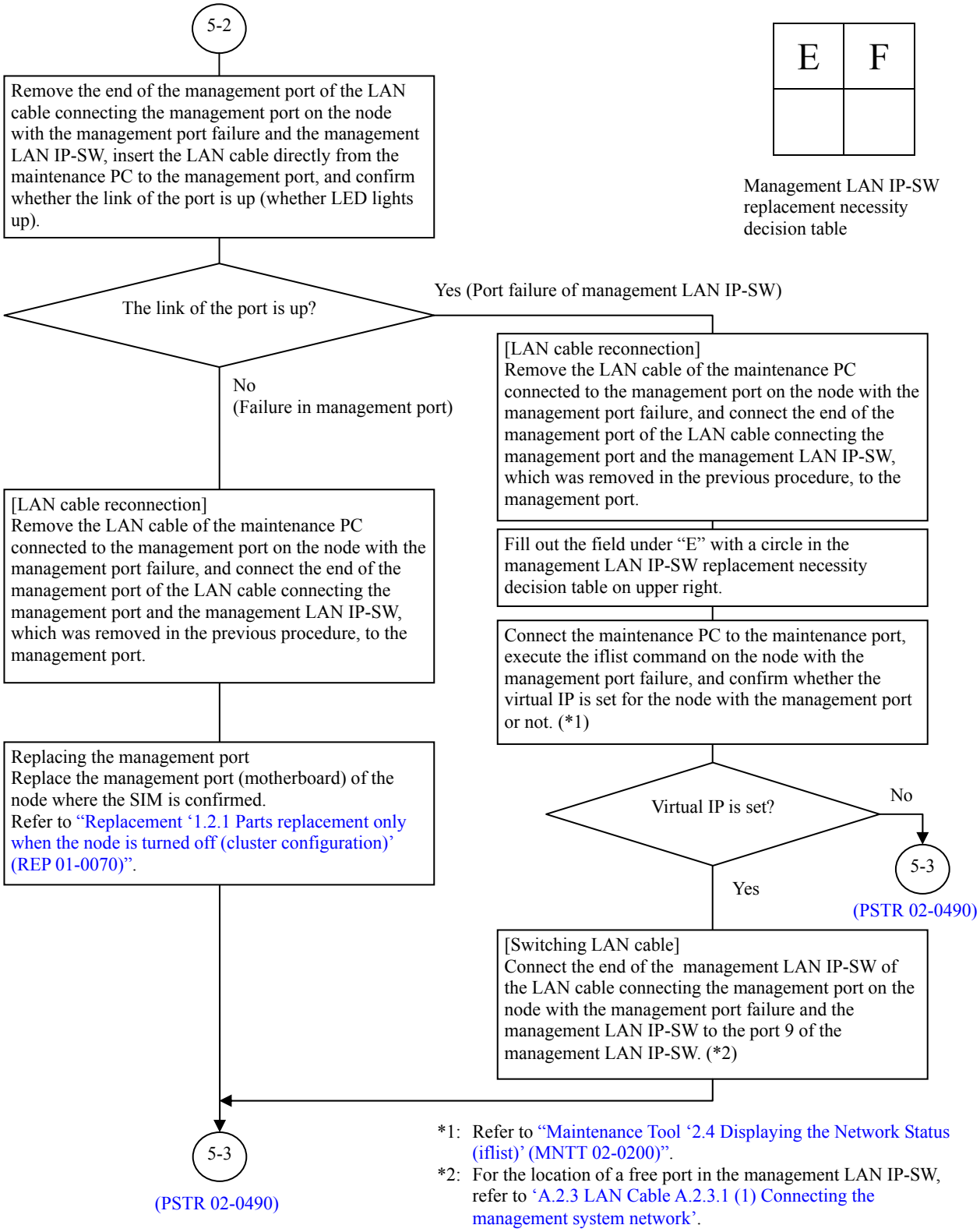

Figure C.2.3.2.2-5 Flow of Management Network Failure Determination (3/6)

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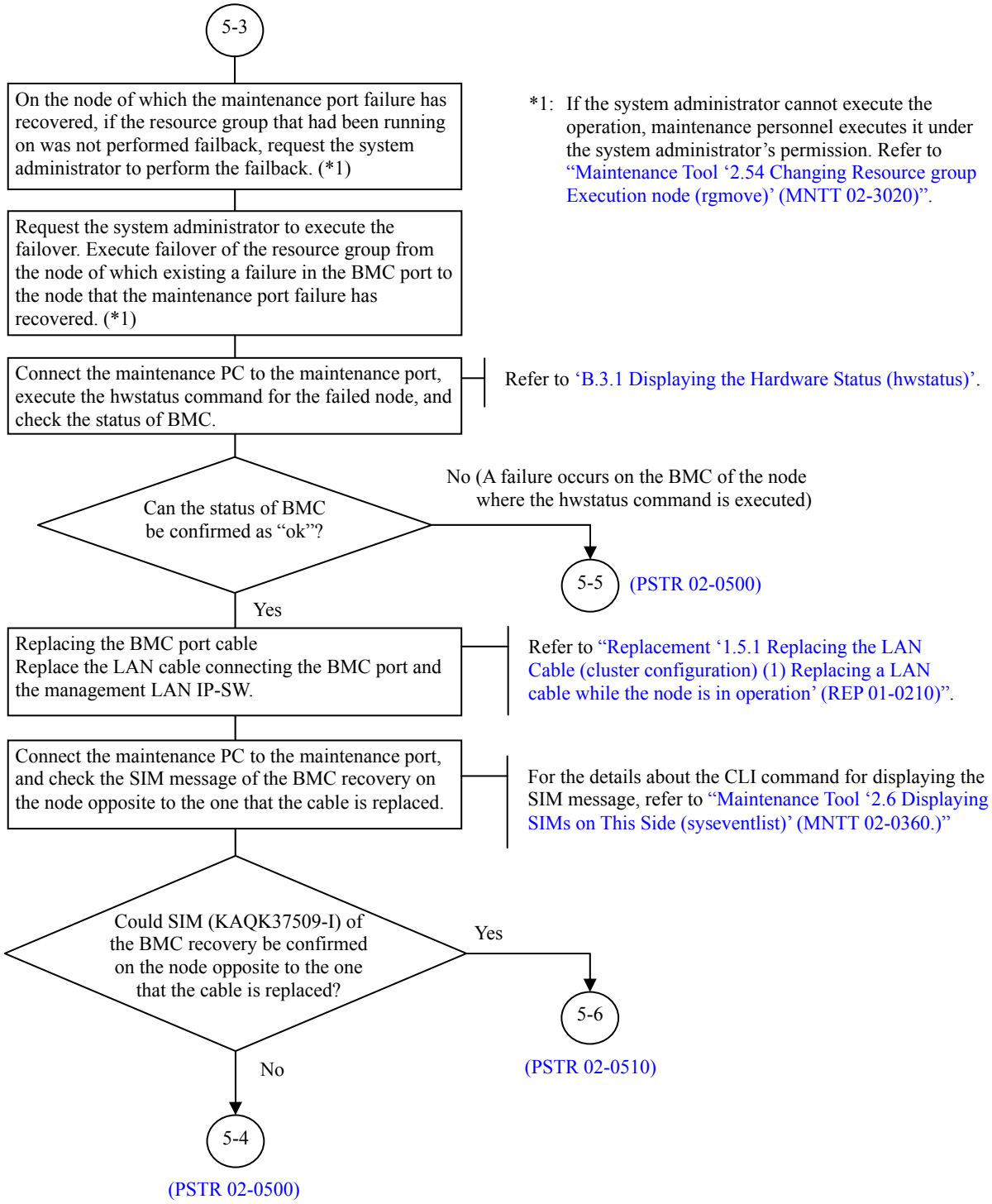

Figure C.2.3.2.2-5 Flow of Management Network Failure Determination (4/6)

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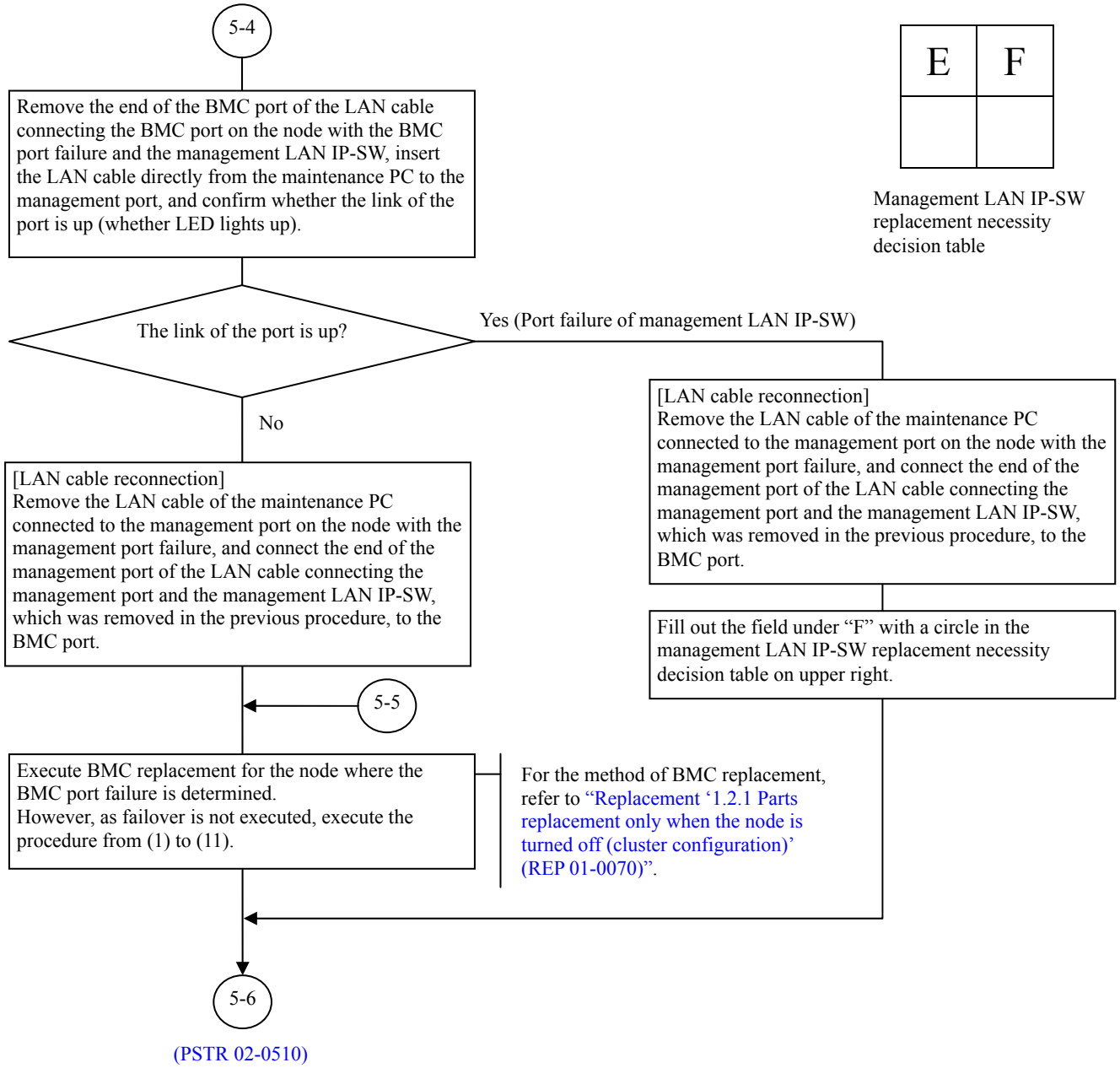

Figure C.2.3.2.2-5 Flow of Management Network Failure Determination (5/6)

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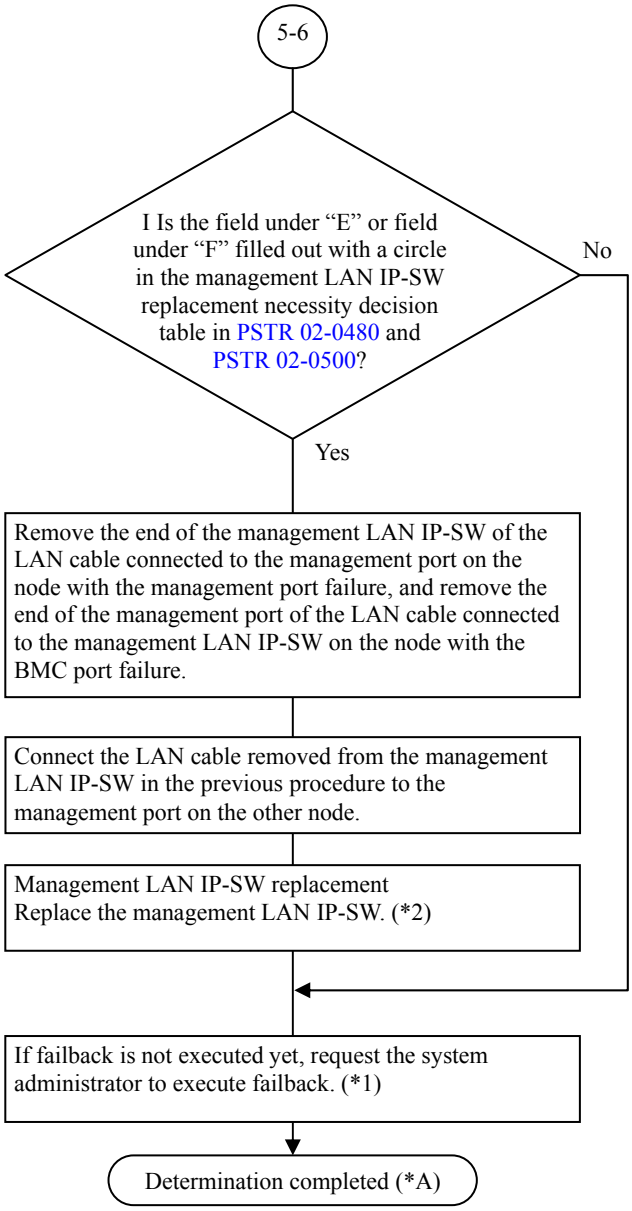

*1: If the system administrator cannot execute the operation, maintenance personnel executes it under the system administrator's permission. Refer to "Maintenance Tool '2.54 Changing Resource group Execution node (rgmove)' (MNTT 02-3020)".

*2: Refer to "Replacement '1.6 Replacing the Management LAN IP-SW (IP Switch) (1) Replacement procedure while the node is in operation' (REP 01-0290)".

*A: After completing determination, return to 'C.2.2.1 Failure determination procedure at the cluster configuration'.

Figure C.2.3.2.2-5 Flow of Management Network Failure Determination (6/6)

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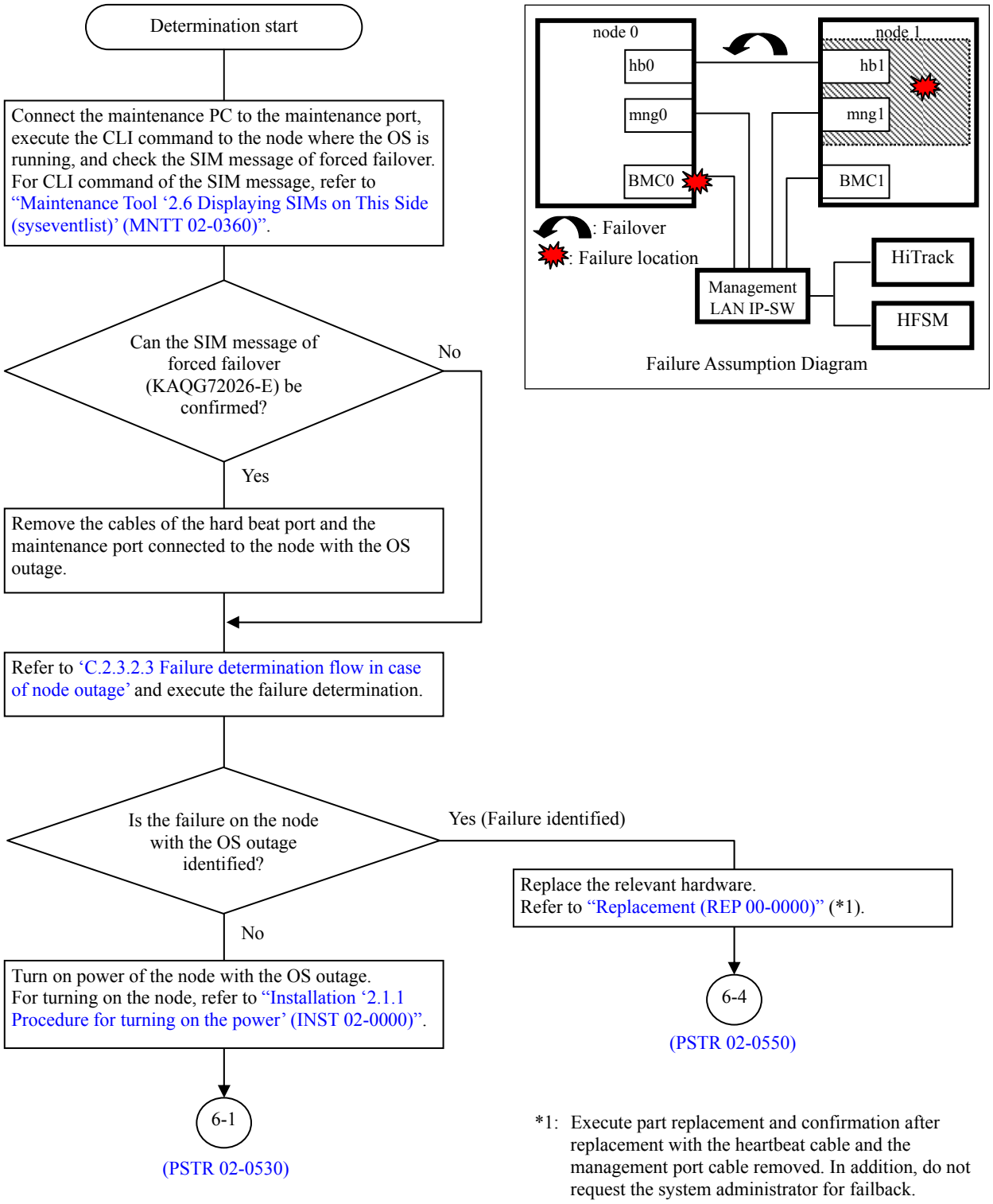
(6) OS down and a failure in the BMC port of the other node



*1: Execute part replacement and confirmation after replacement with the heartbeat cable and the management port cable removed. In addition, do not request the system administrator for failback.

Figure C.2.3.2.2-6 Flow of Management Network Failure Determination (1/5)

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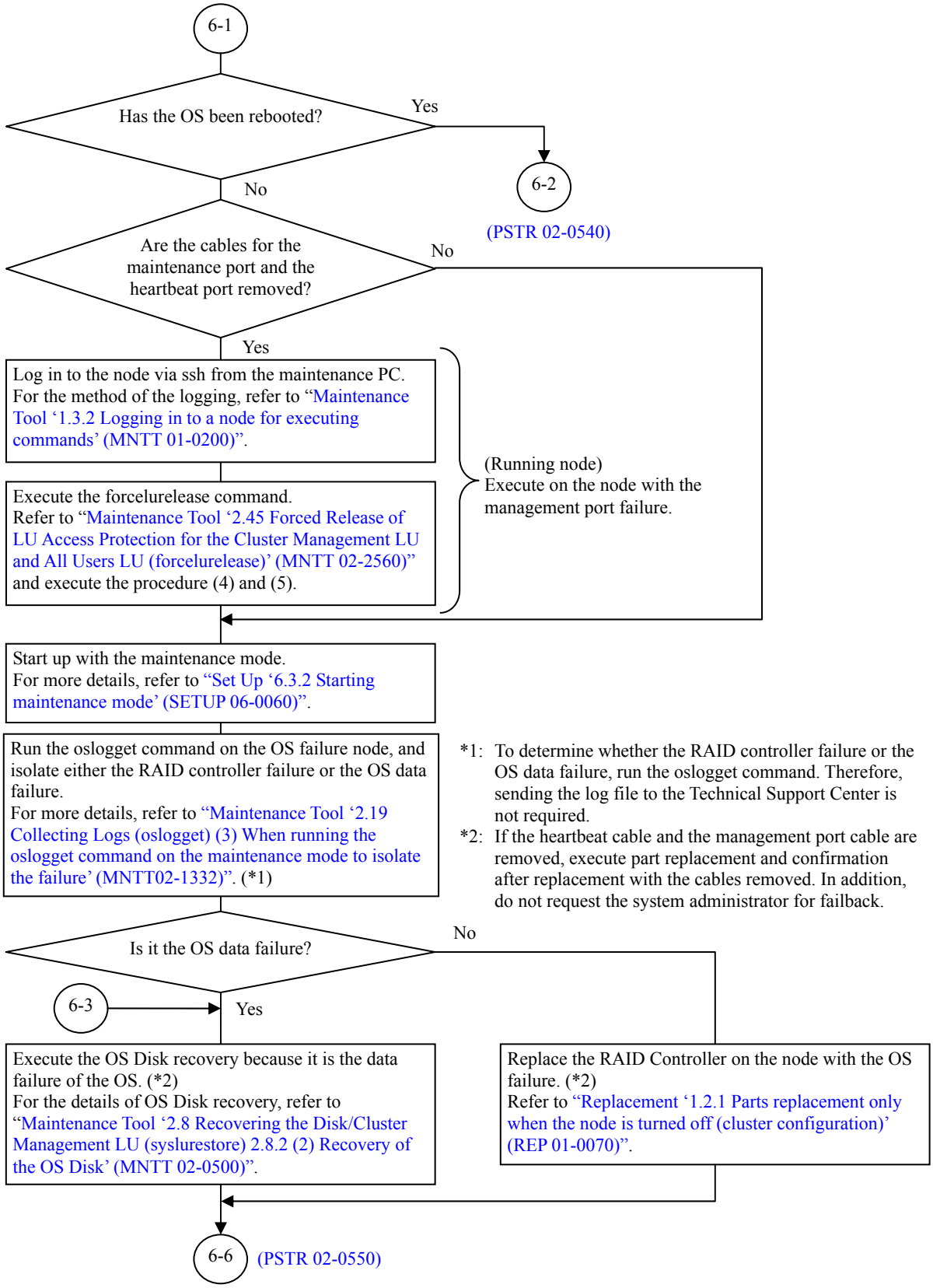

Figure C.2.3.2.2-6 Flow of Management Network Failure Determination (2/5)

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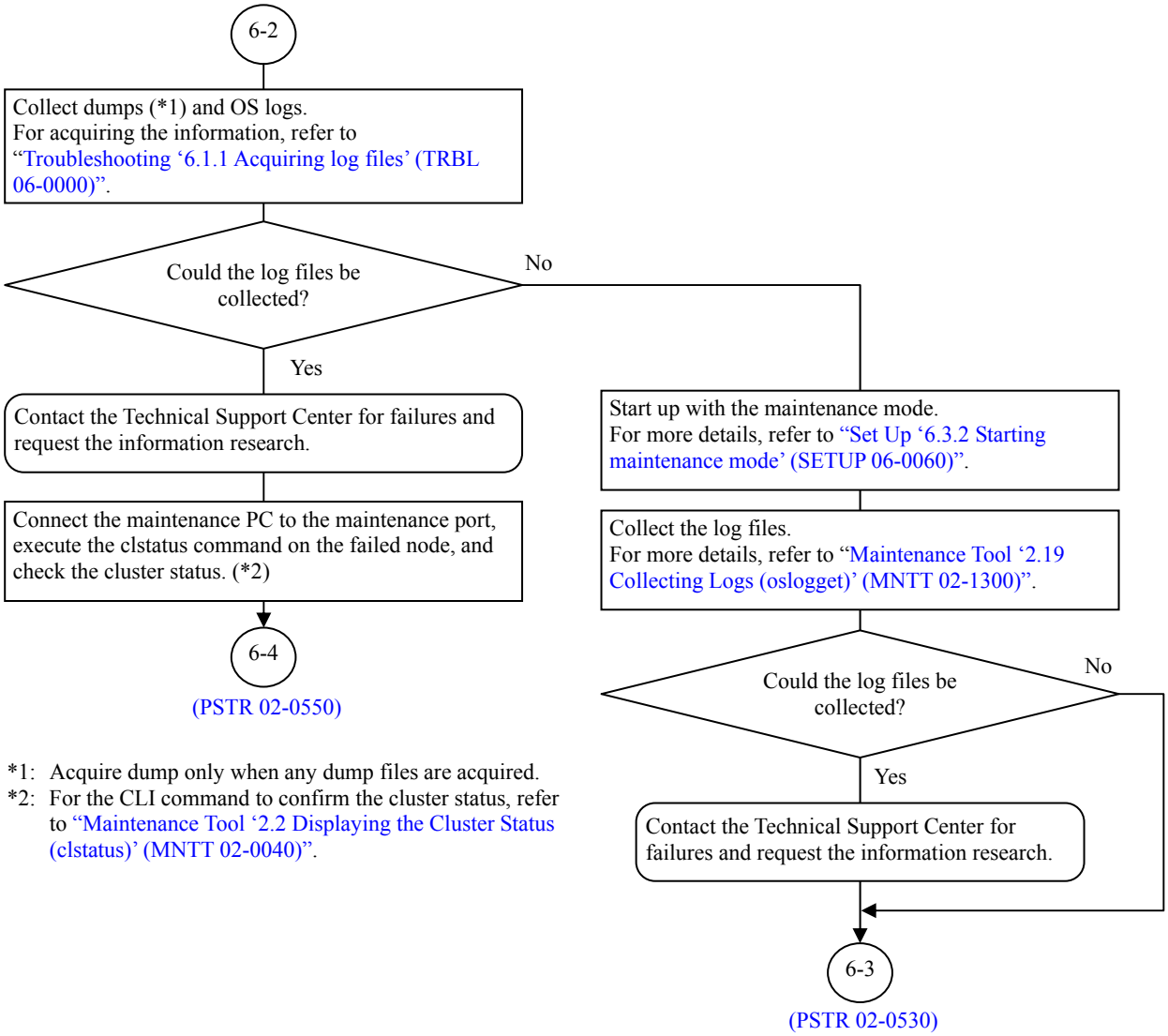

*1: Acquire dump only when any dump files are acquired.
*2: For the CLI command to confirm the cluster status, refer to "Maintenance Tool '2.2 Displaying the Cluster Status (clstatus)' (MNTT 02-0040)".

Figure C.2.3.2.2-6 Flow of Management Network Failure Determination (3/5)

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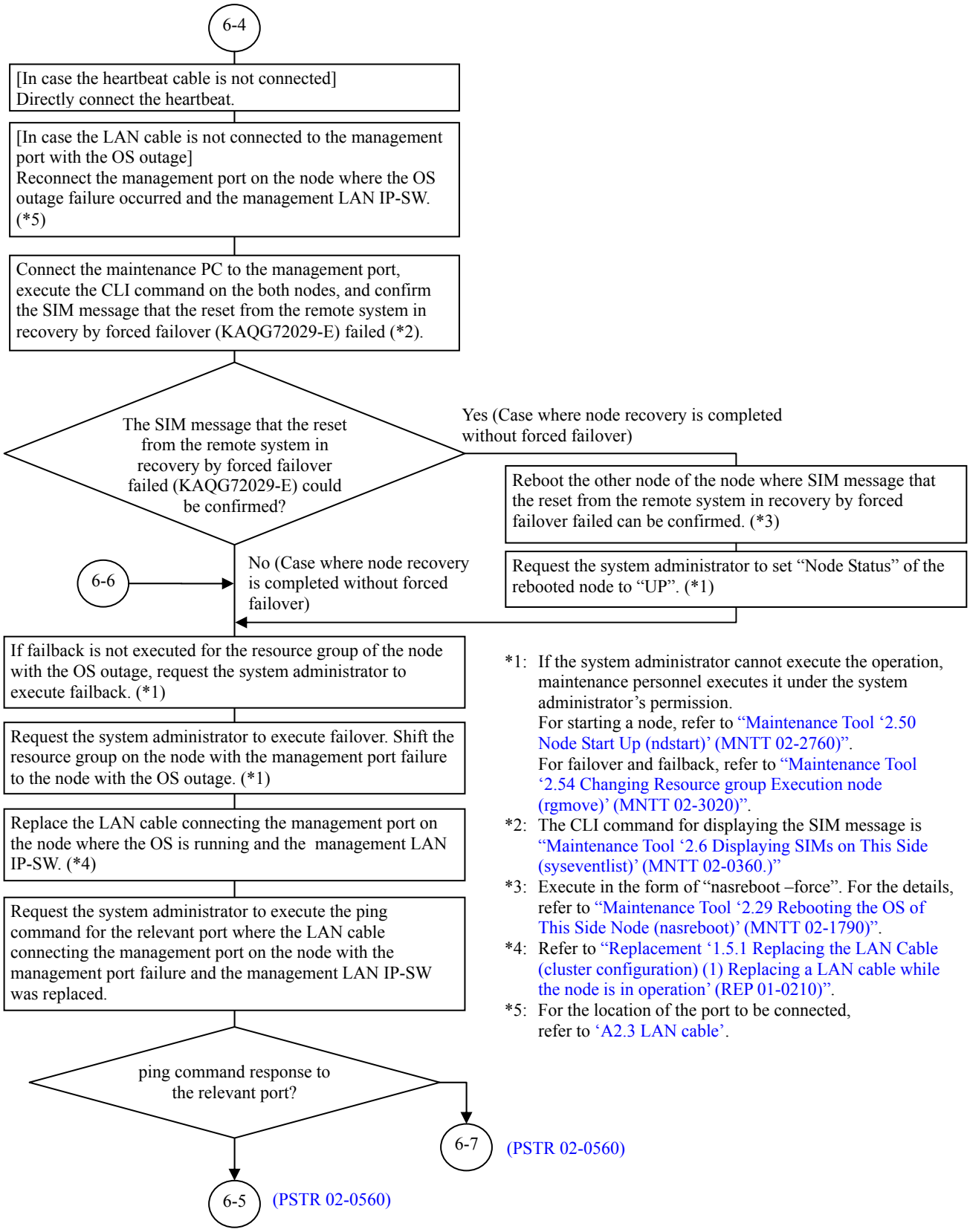

Figure C.2.3.2.2-6 Flow of Management Network Failure Determination (4/5)

Copyright © 2011, 2014, Hitachi, Ltd.

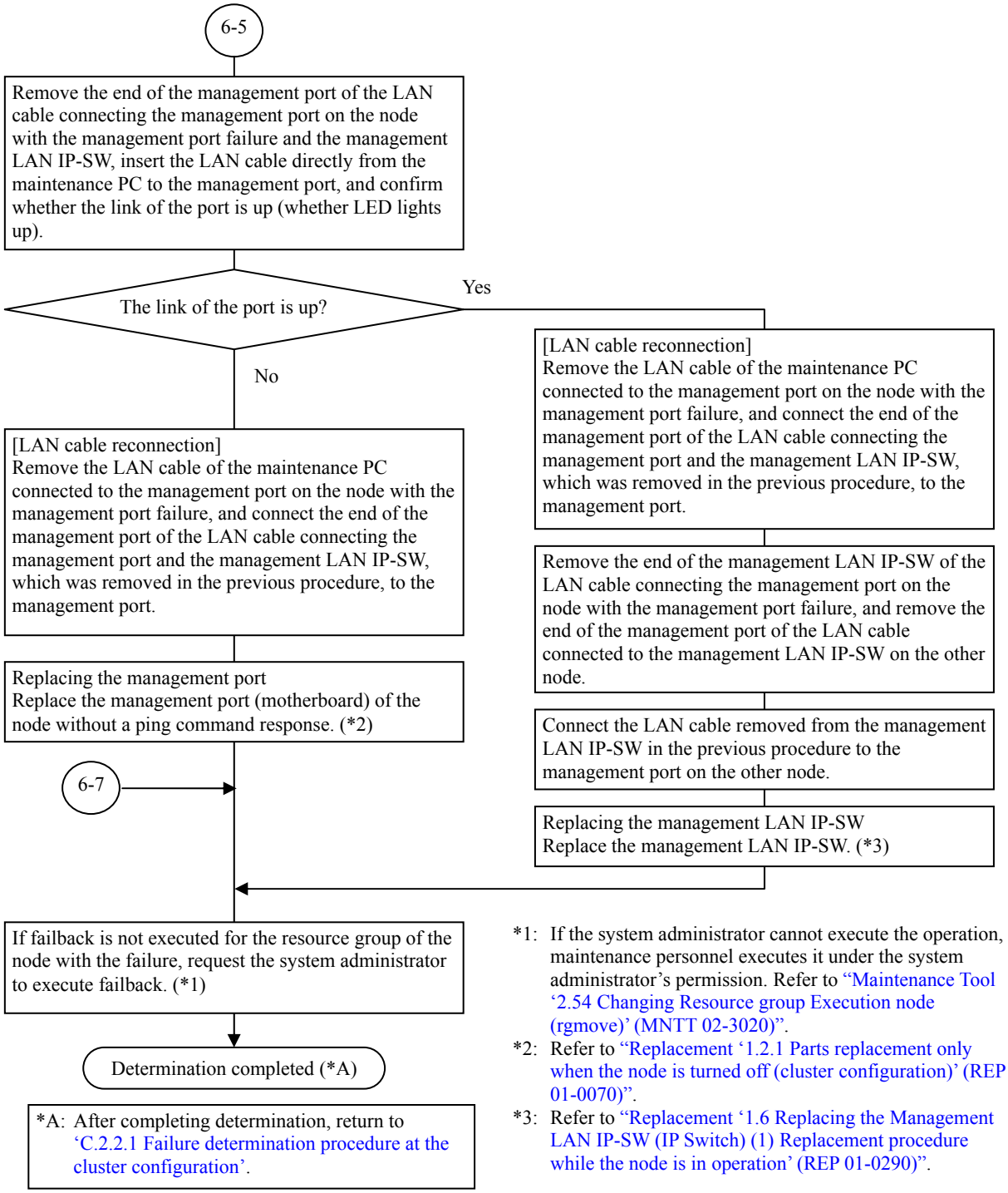

Figure C.2.3.2.2-6 Flow of Management Network Failure Determination (5/5)

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(7) Failure in the management ports of the both nodes

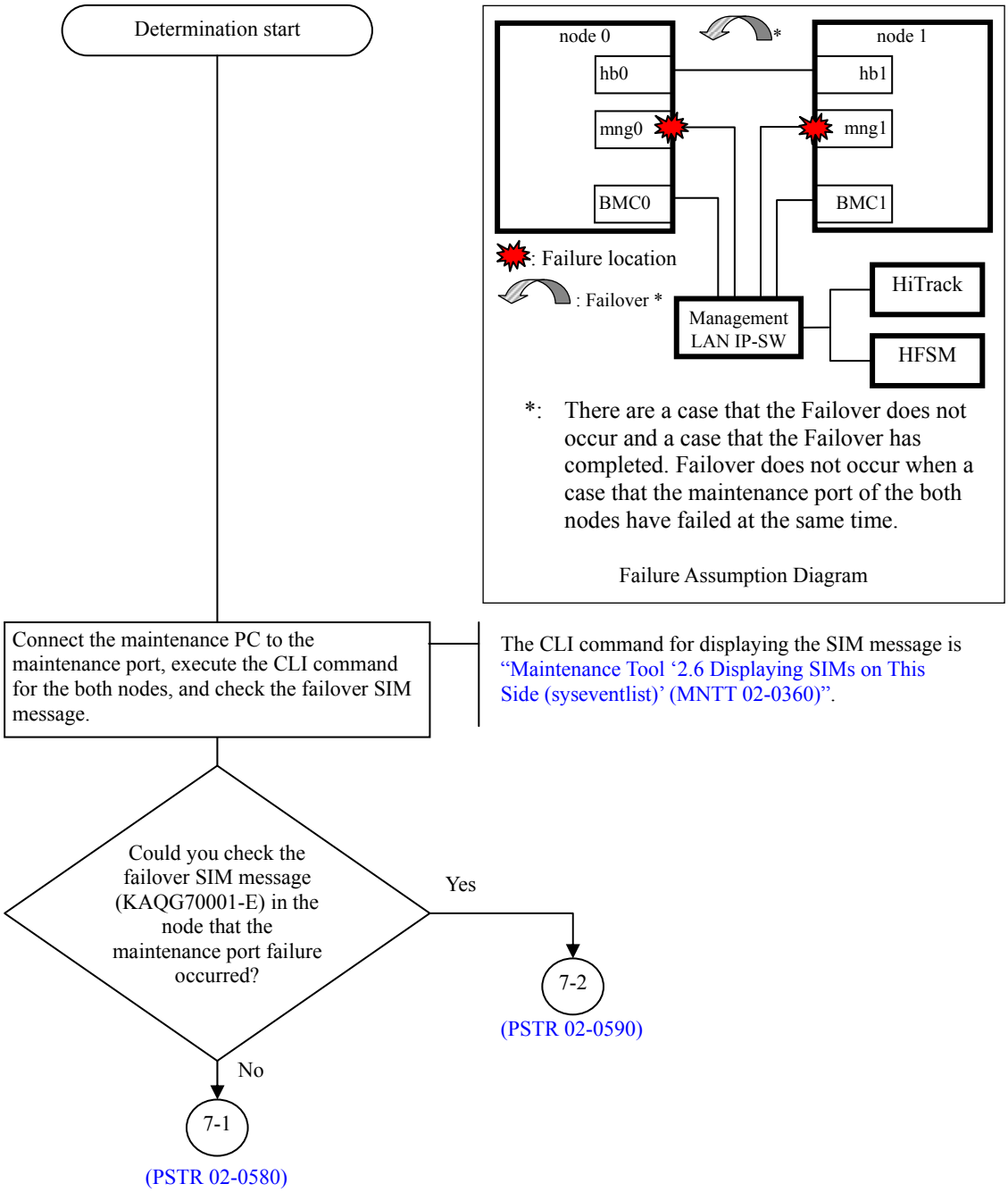

Figure C.2.3.2.2-7 Flow of Management Network Failure Determination (1/11)

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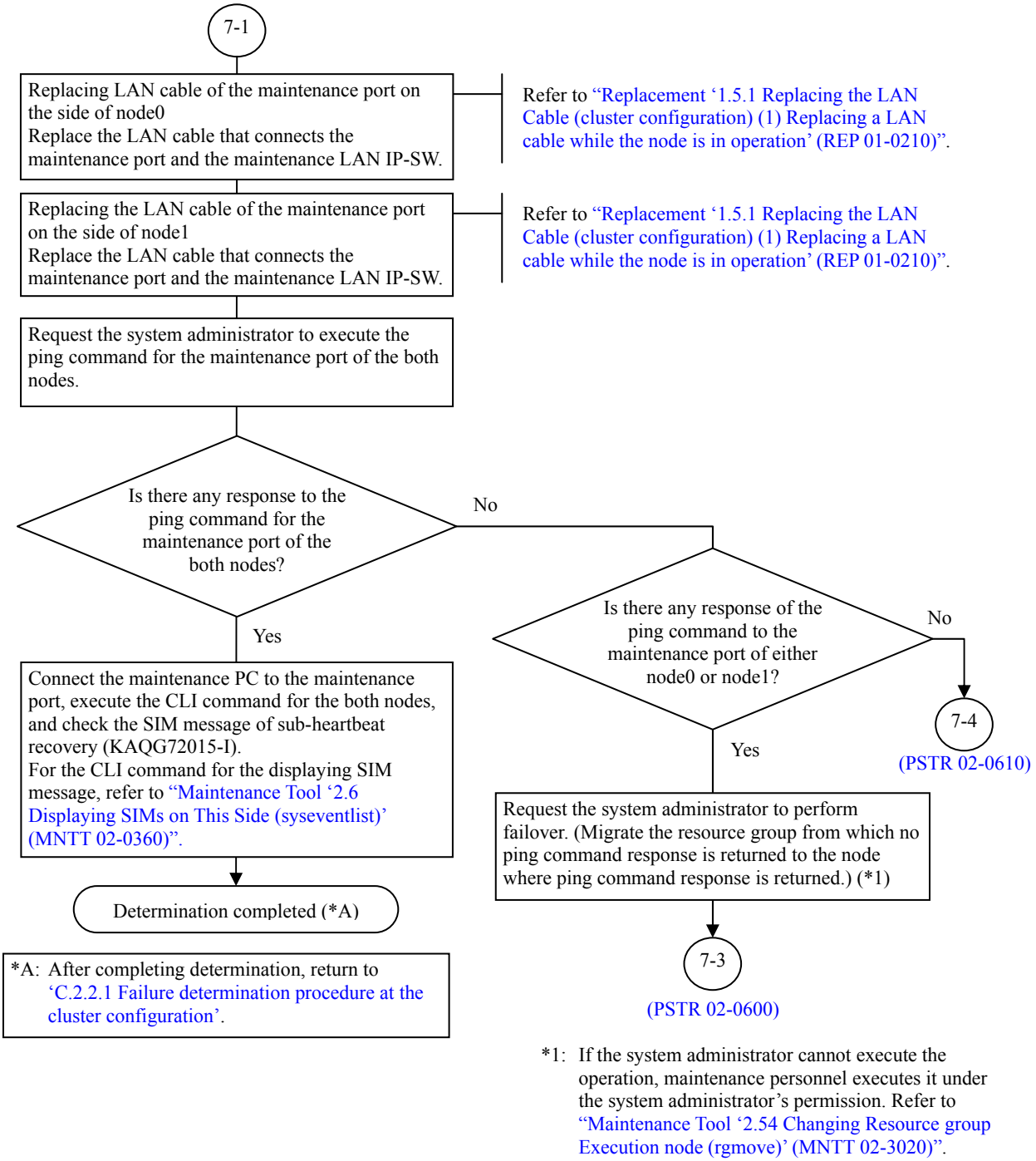

Figure C.2.3.2.2-7 Flow of Management Network Failure Determination (2/11)

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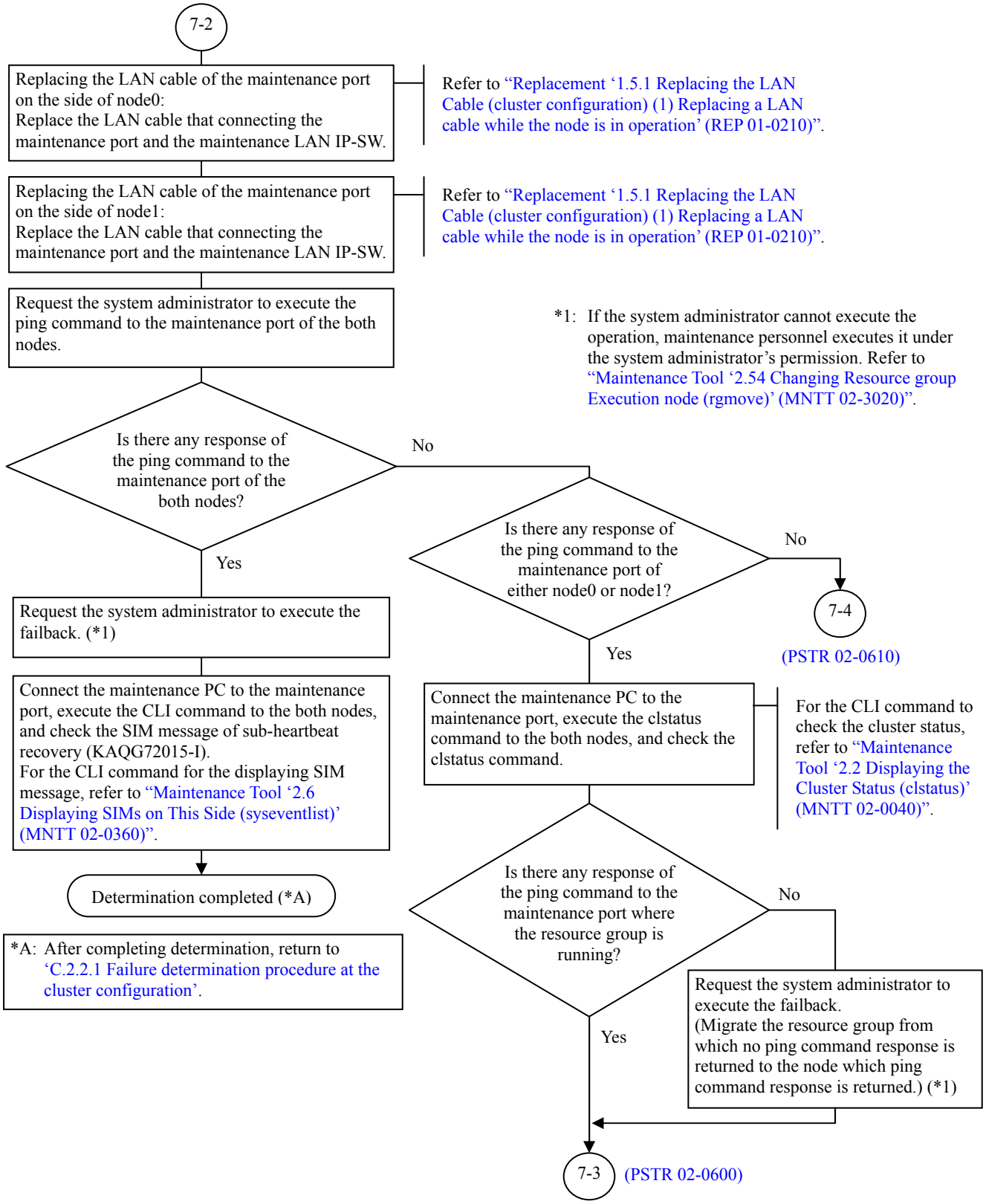

Figure C.2.3.2.2-7 Flow of Management Network Failure Determination (3/11)

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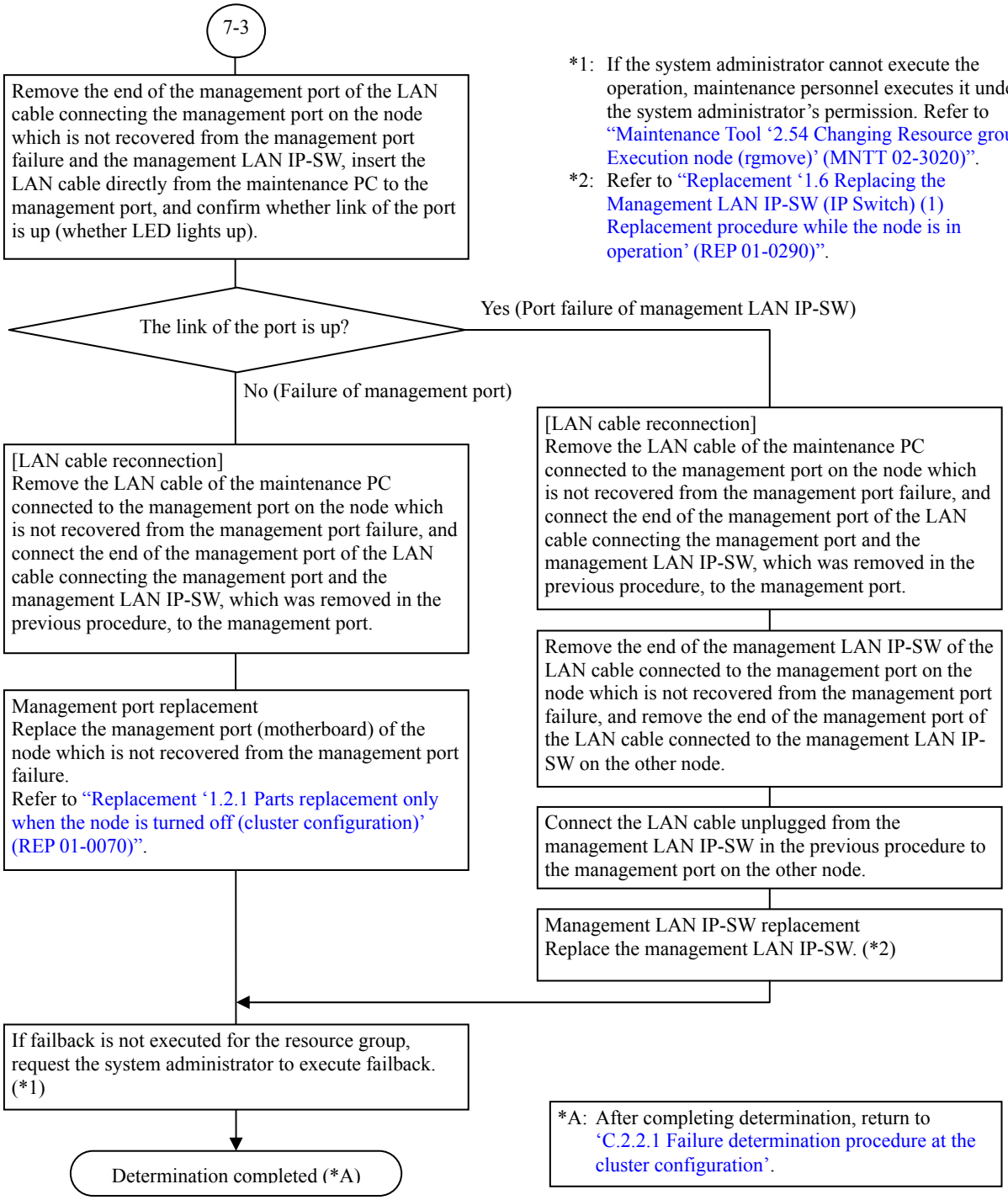

Figure C.2.3.2.2-7 Flow of Management Network Failure Determination (4/11)

Copyright © 2011, 2013, Hitachi, Ltd.

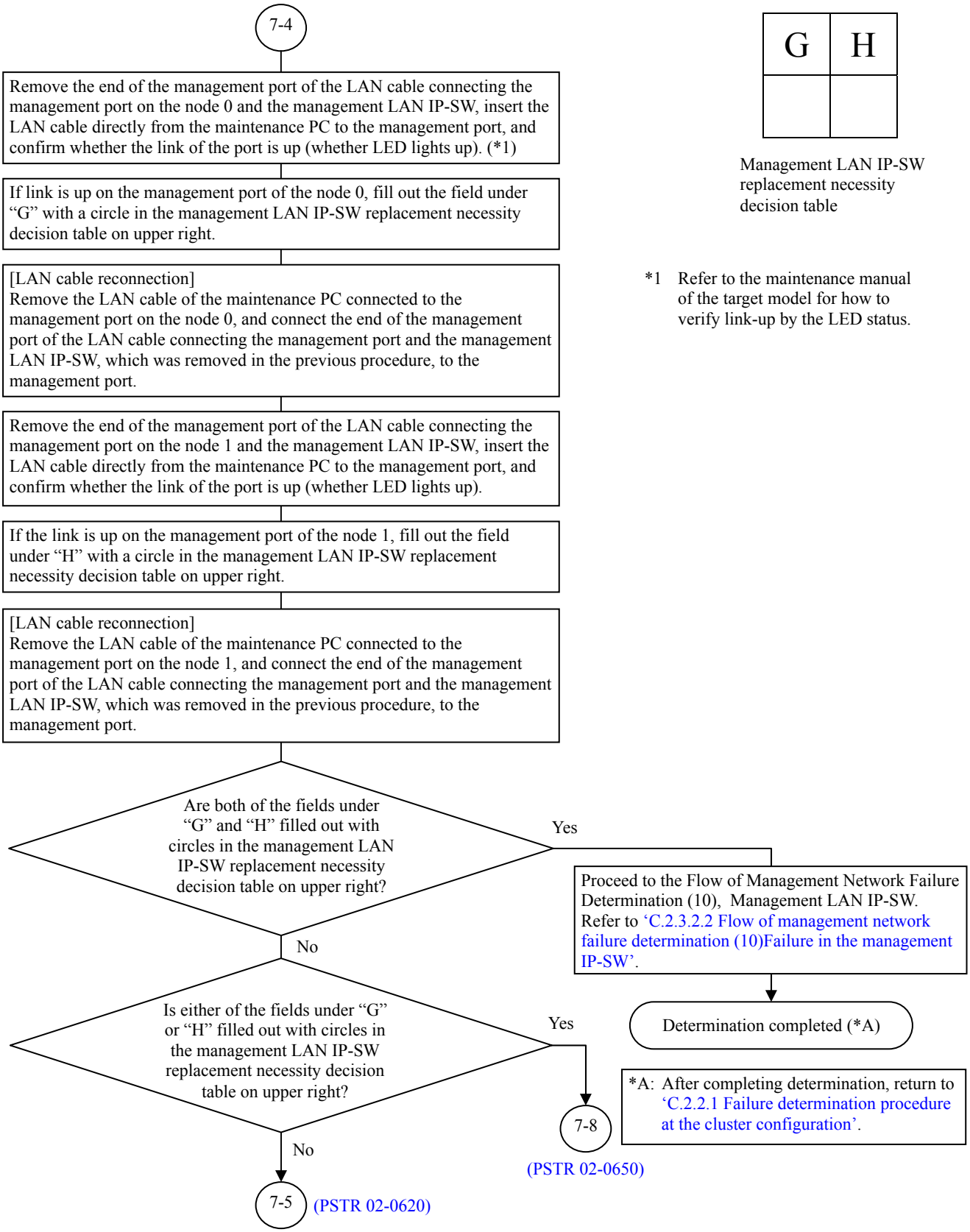

Figure C.2.3.2.2-7 Flow of Management Network Failure Determination (5/11)

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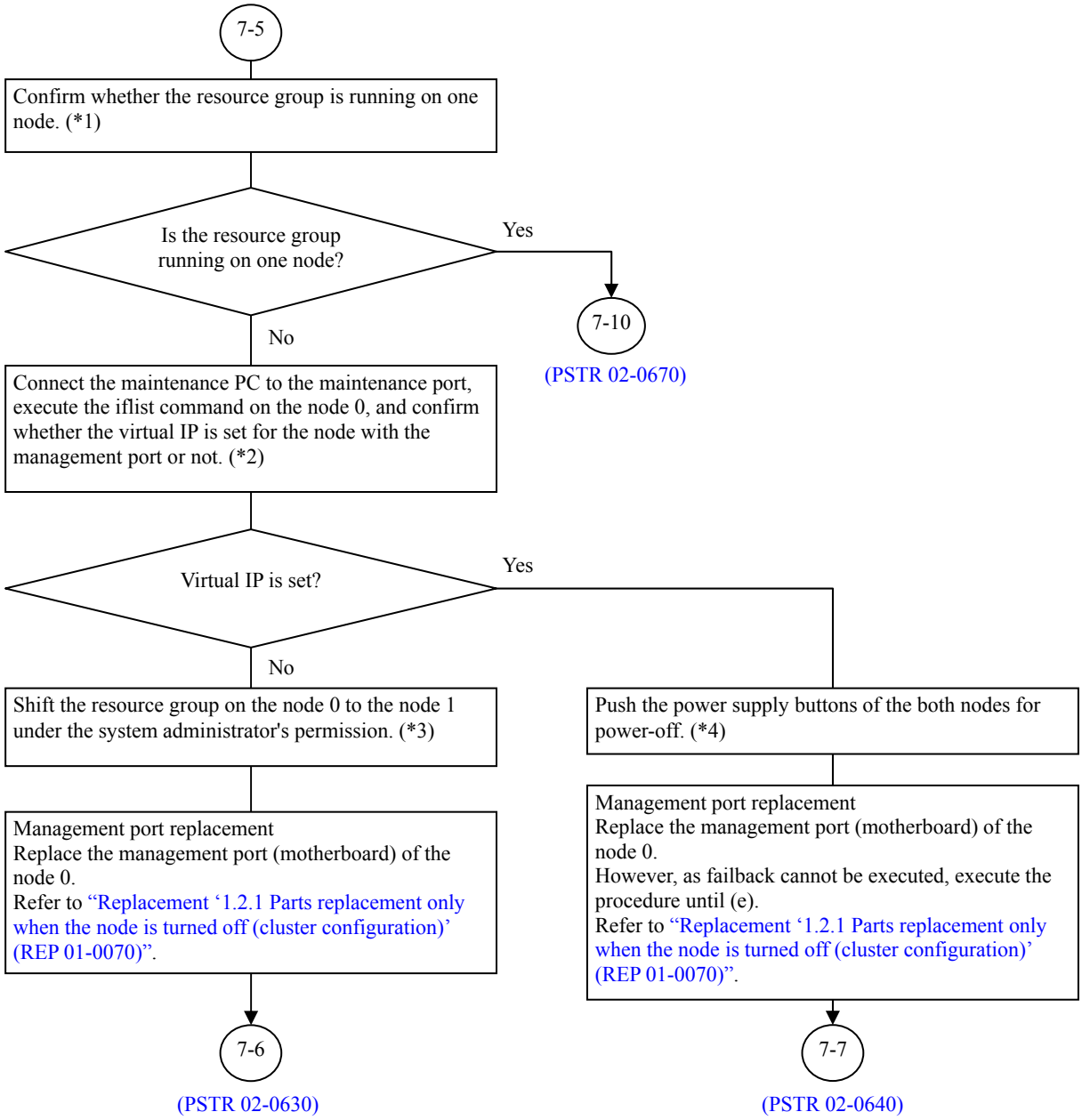

*1: Refer to "Maintenance Tool '2.2 Displaying the Cluster Status (clstatus)' (MNTT 02-0040)".
*2: Refer to "Maintenance Tool '2.4 Displaying the Network Status (iflist)' (MNTT 02-0200)".
*3: Refer to "Maintenance Tool '3.1 Failover and Node Termination to Execute the OS stop or the OS reboot' (MNTT 03-0000)", and execute the procedure from (1) to (4).
*4: Refer to "Installation '2.1.2.2 Terminating the OS of the node by operating the power button' (INST 02-0080)".

Figure C.2.3.2.2-7 Flow of Management Network Failure Determination (6/11)

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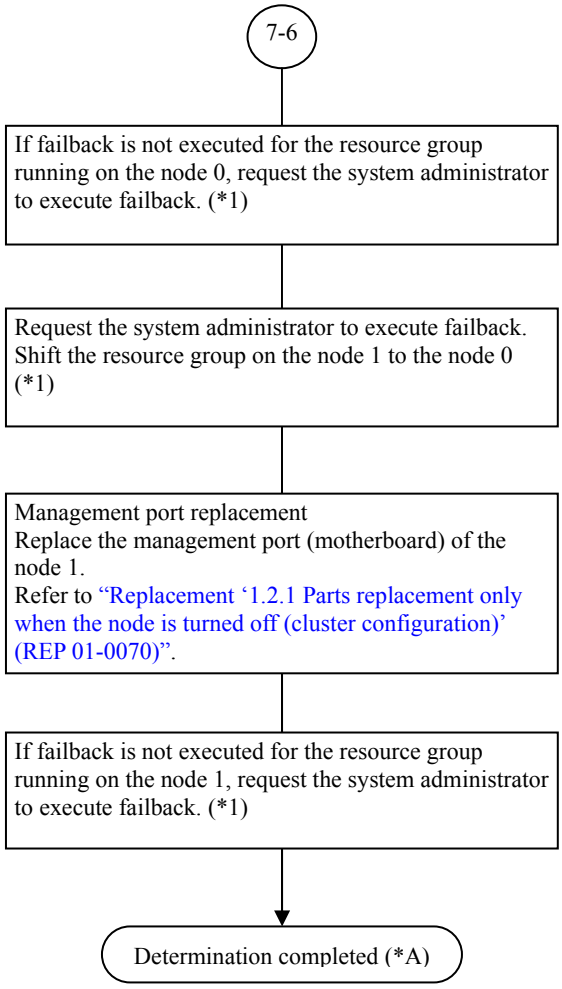

*1: If the system administrator cannot execute the operation, maintenance personnel executes it under the system administrator's permission. Refer to "Maintenance Tool '2.54 Changing Resource group Execution node (rgmove)' (MNTT 02-3020)".

*A: After completing determination, return to 'C.2.2.1 Failure determination procedure at the cluster configuration'.

Figure C.2.3.2.2-7 Flow of Management Network Failure Determination (7/11)

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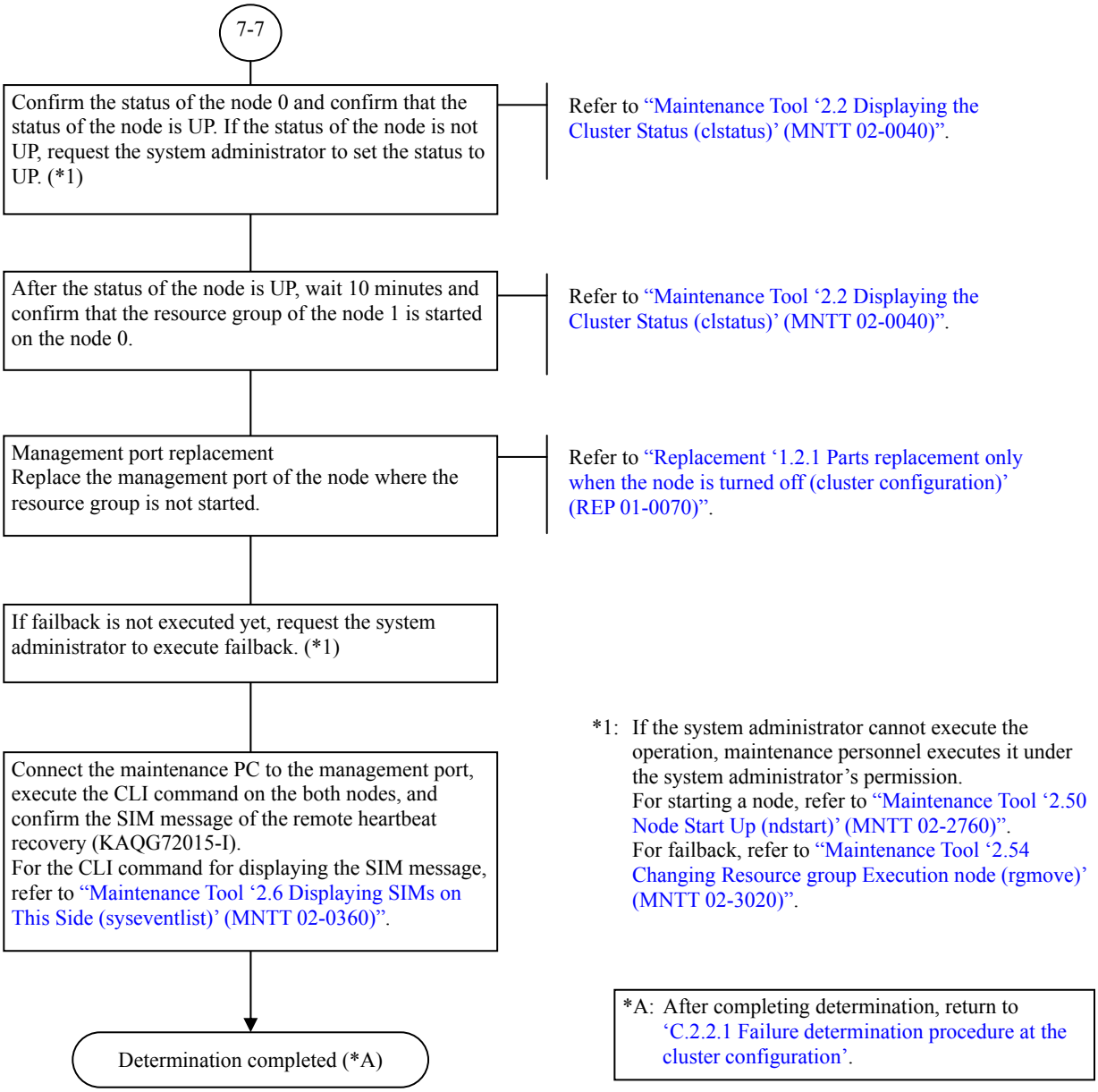

Figure C.2.3.2.2-7 Flow of Management Network Failure Determination (8/11)

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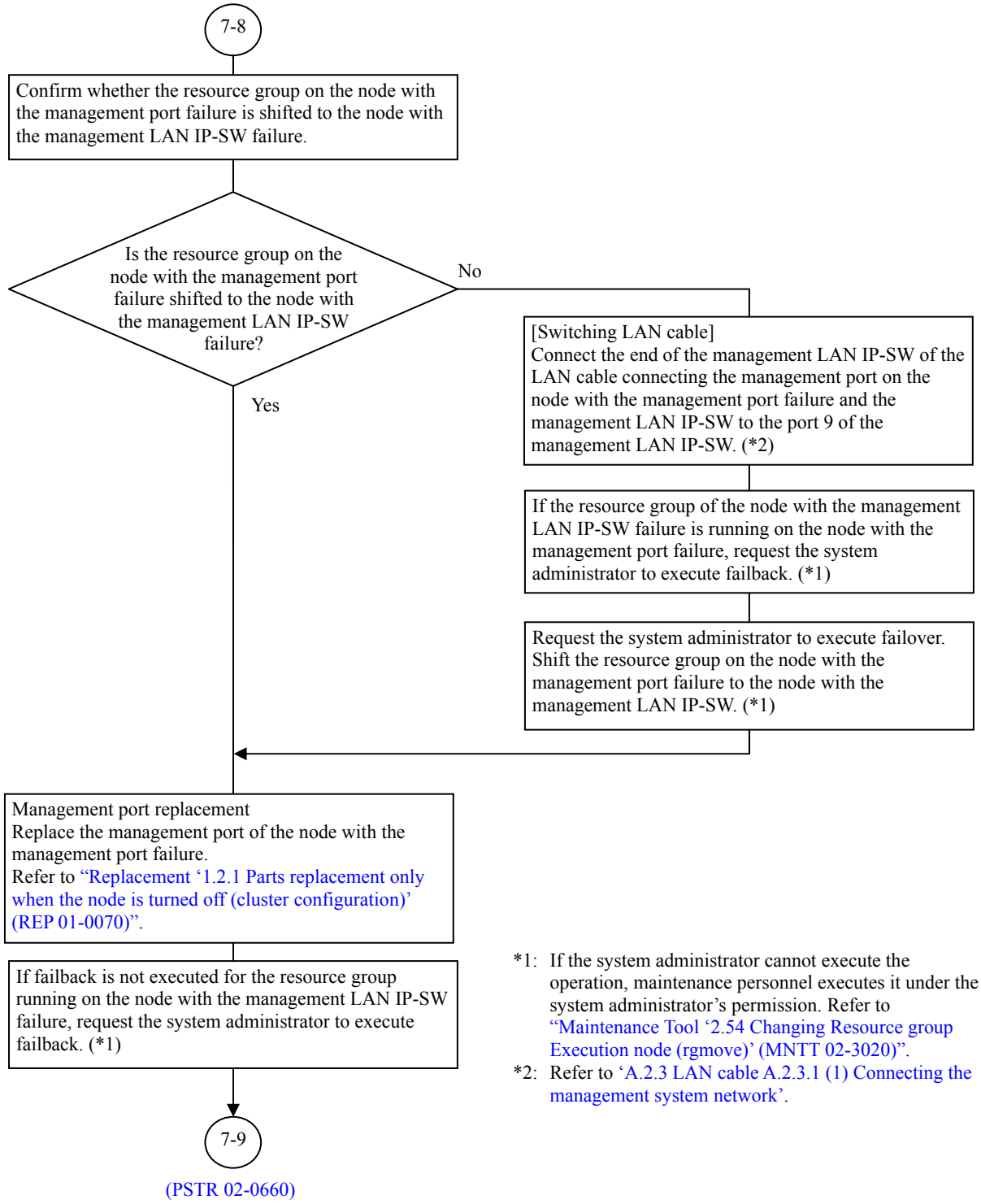

*1: If the system administrator cannot execute the operation, maintenance personnel executes it under the system administrator's permission. Refer to "Maintenance Tool '2.54 Changing Resource group Execution node (rgmove)' (MNTT 02-3020)".

*2: Refer to 'A.2.3 LAN cable A.2.3.1 (1) Connecting the management system network'.

Figure C.2.3.2.2-7 Flow of Management Network Failure Determination (9/11)

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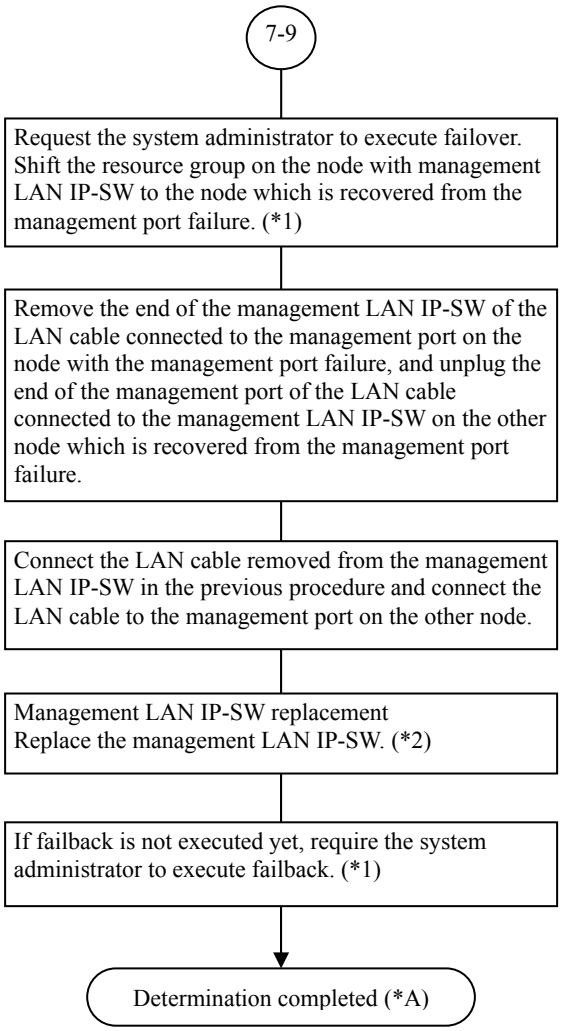

*1: If the system administrator cannot execute the operation, a maintenance personnel executes it under the system administrator's permission. Refer to "Maintenance Tool '2.54 Changing Resource group Execution node (rgmove)' (MNTT 02-3020)".

*2: For the location of a free port in the management LAN IP-SW, refer to "Replacement '1.6 Replacing the Management LAN IP-SW (IP Switch) (1) Replacement procedure while the node is in operation' (REP 01-0290)".

*A: After completing determination, return to 'C.2.2.1 Failure determination procedure at the cluster configuration'.

Figure C.2.3.2.2-7 Flow of Management Network Failure Determination (10/11)

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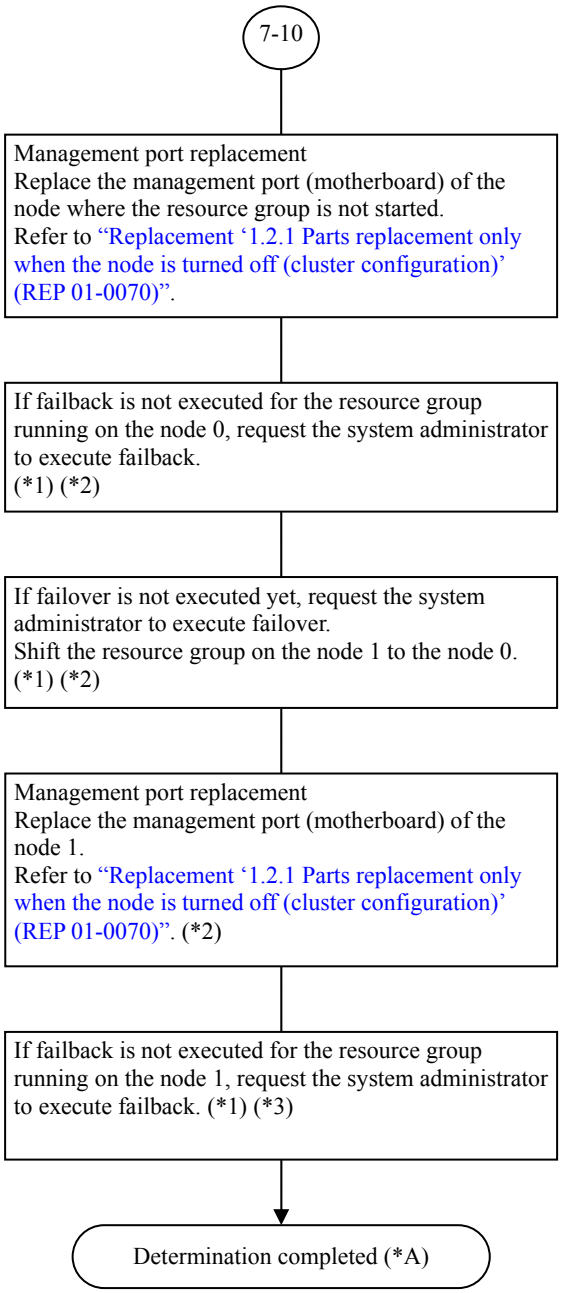

*1: If the system administrator cannot execute the operation, maintenance personnel executes it under the system administrator's permission. Refer to "Maintenance Tool '2.54 Changing Resource group Execution node (rgmove)' (MNTT 02-3020)".

*2: If the management port on the node 1 is already replaced, read the node 1 as the node 0, and the node 0 as the node 1.

*3: If the management port (motherboard) on the node 0 is replaced in the previous procedure, read the node 1 as the node 0.

*A: After completing determination, return to 'C.2.2.1 Failure determination procedure at the cluster configuration'.

Figure C.2.3.2.2-7 Flow of Management Network Failure Determination (11/11)

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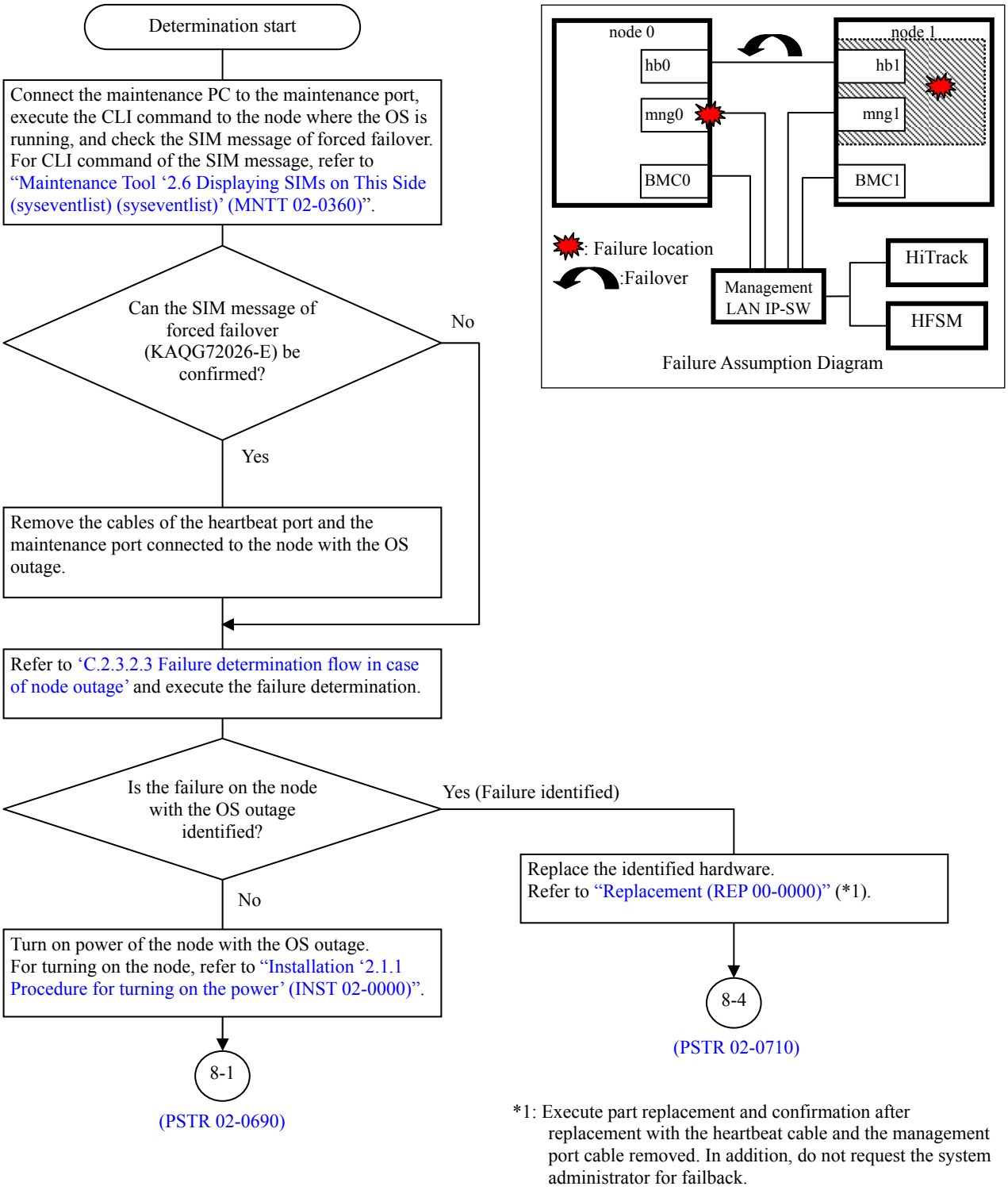
(8) Failure in the management port of the other node after the OS down and the failover completion



*1: Execute part replacement and confirmation after replacement with the heartbeat cable and the management port cable removed. In addition, do not request the system administrator for failback.

Figure C.2.3.2.2-8 Flow of Management Network Failure Determination (1/5)

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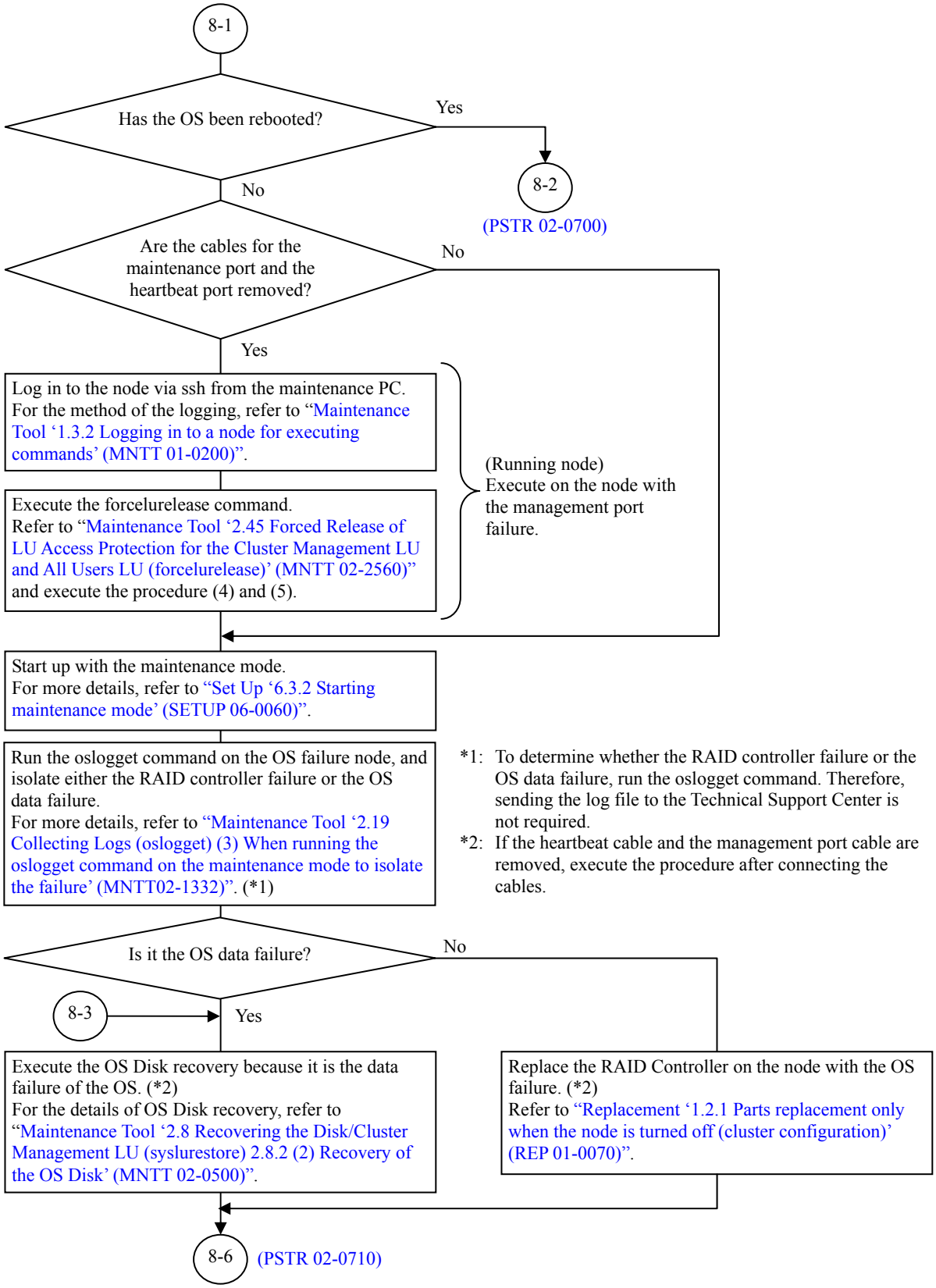

Figure C.2.3.2.2-8 Flow of Management Network Failure Determination (2/5)

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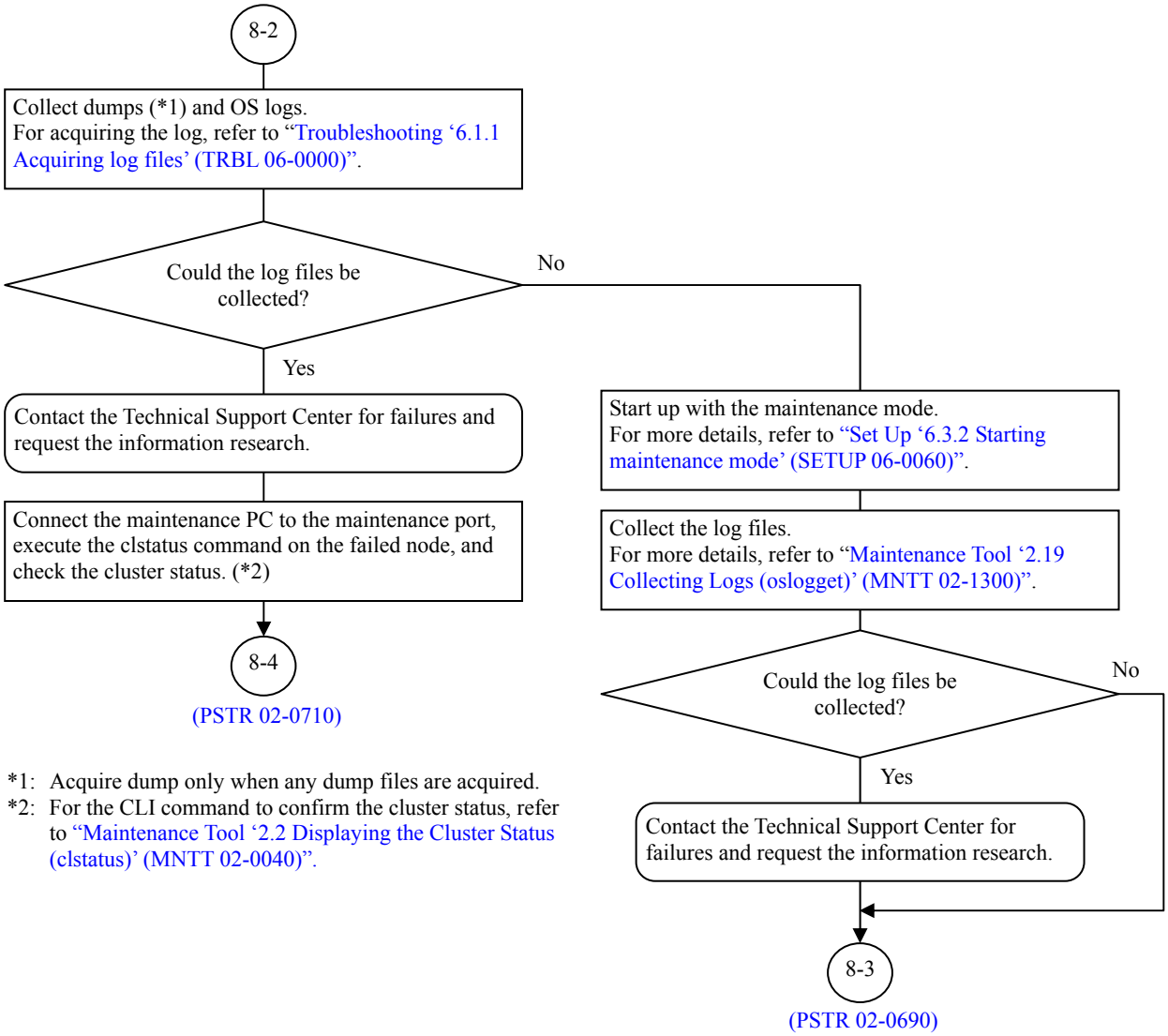

*1: Acquire dump only when any dump files are acquired.
*2: For the CLI command to confirm the cluster status, refer to "Maintenance Tool '2.2 Displaying the Cluster Status (clstatus)' (MNTT 02-0040)".

Figure C.2.3.2.2-8 Flow of Management Network Failure Determination (3/5)

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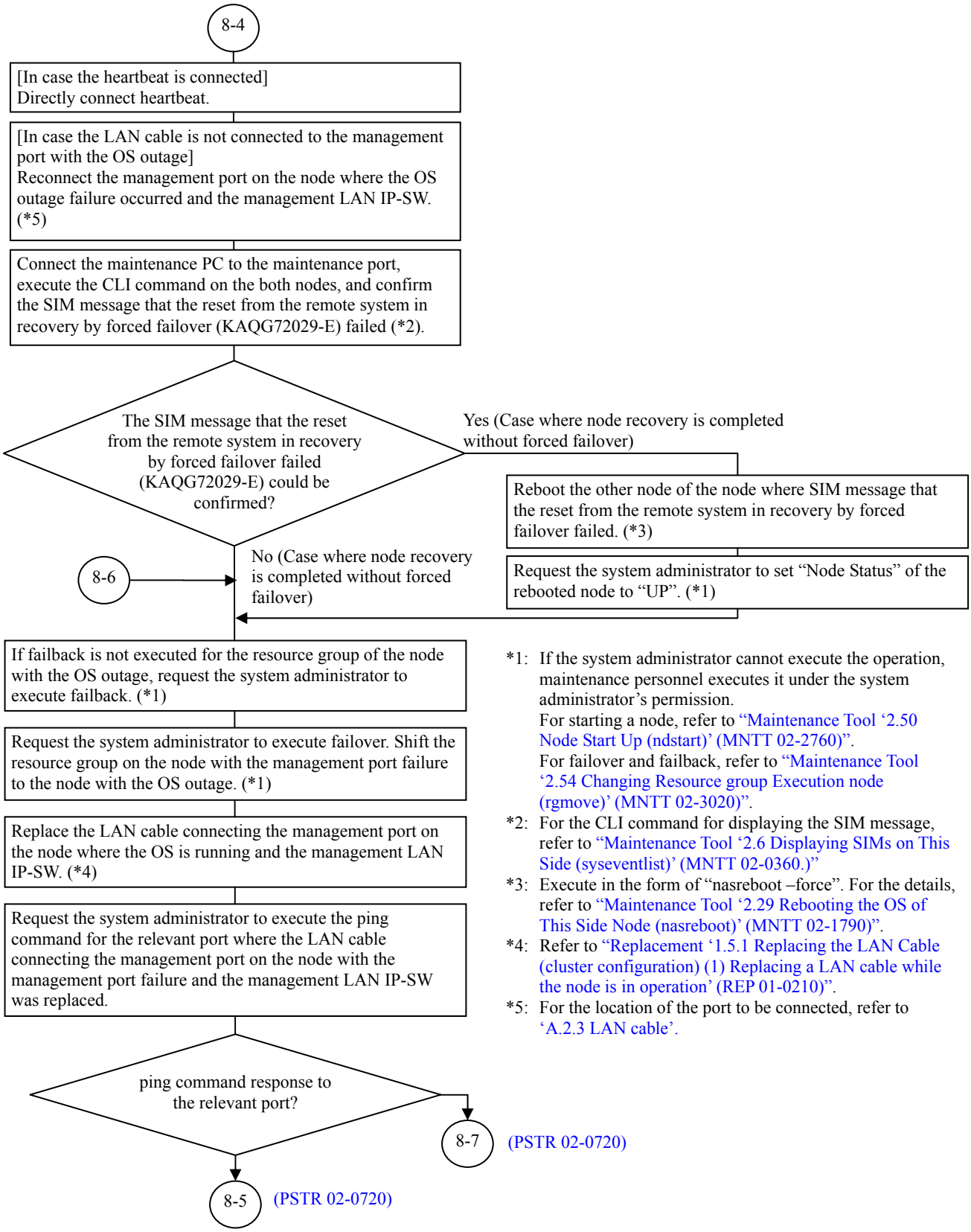

*1: If the system administrator cannot execute the operation, maintenance personnel executes it under the system administrator's permission.
For starting a node, refer to "Maintenance Tool '2.50 Node Start Up (ndstart)' (MNTT 02-2760)".
For failover and failback, refer to "Maintenance Tool '2.54 Changing Resource group Execution node (rgmove)' (MNTT 02-3020)".

*2: For the CLI command for displaying the SIM message, refer to "Maintenance Tool '2.6 Displaying SIMs on This Side (syseventlist)' (MNTT 02-0360.)"

*3: Execute in the form of "nasreboot –force". For the details, refer to "Maintenance Tool '2.29 Rebooting the OS of This Side Node (nasreboot)' (MNTT 02-1790)".

*4: Refer to "Replacement '1.5.1 Replacing the LAN Cable (cluster configuration) (1) Replacing a LAN cable while the node is in operation' (REP 01-0210)".

*5: For the location of the port to be connected, refer to 'A.2.3 LAN cable'.

Figure C.2.3.2.2-8 Flow of Management Network Failure Determination (4/5)

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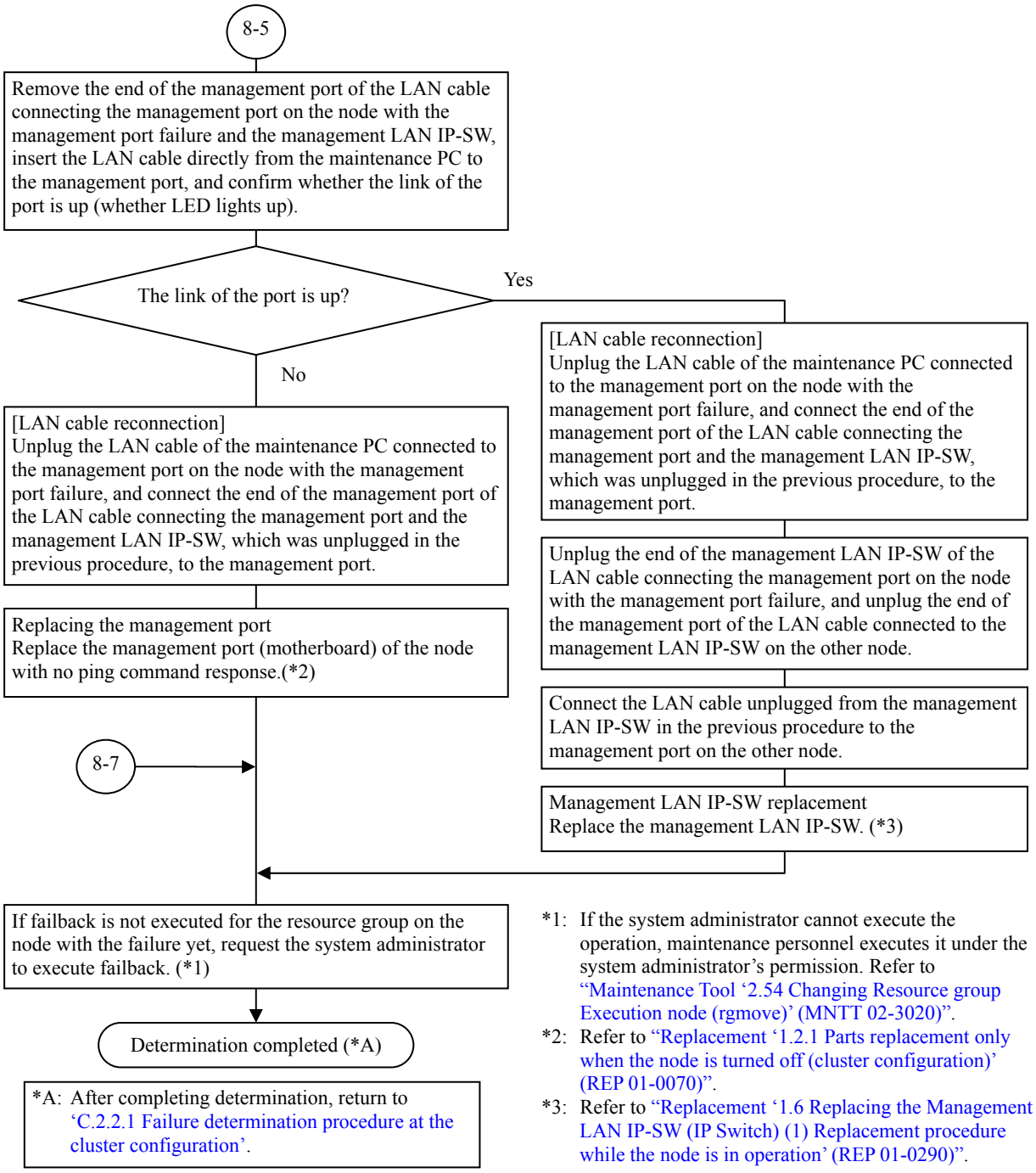

Figure C.2.3.2.2-8 Flow of Management Network Failure Determination (5/5)

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(9) Double failures in the operating systems

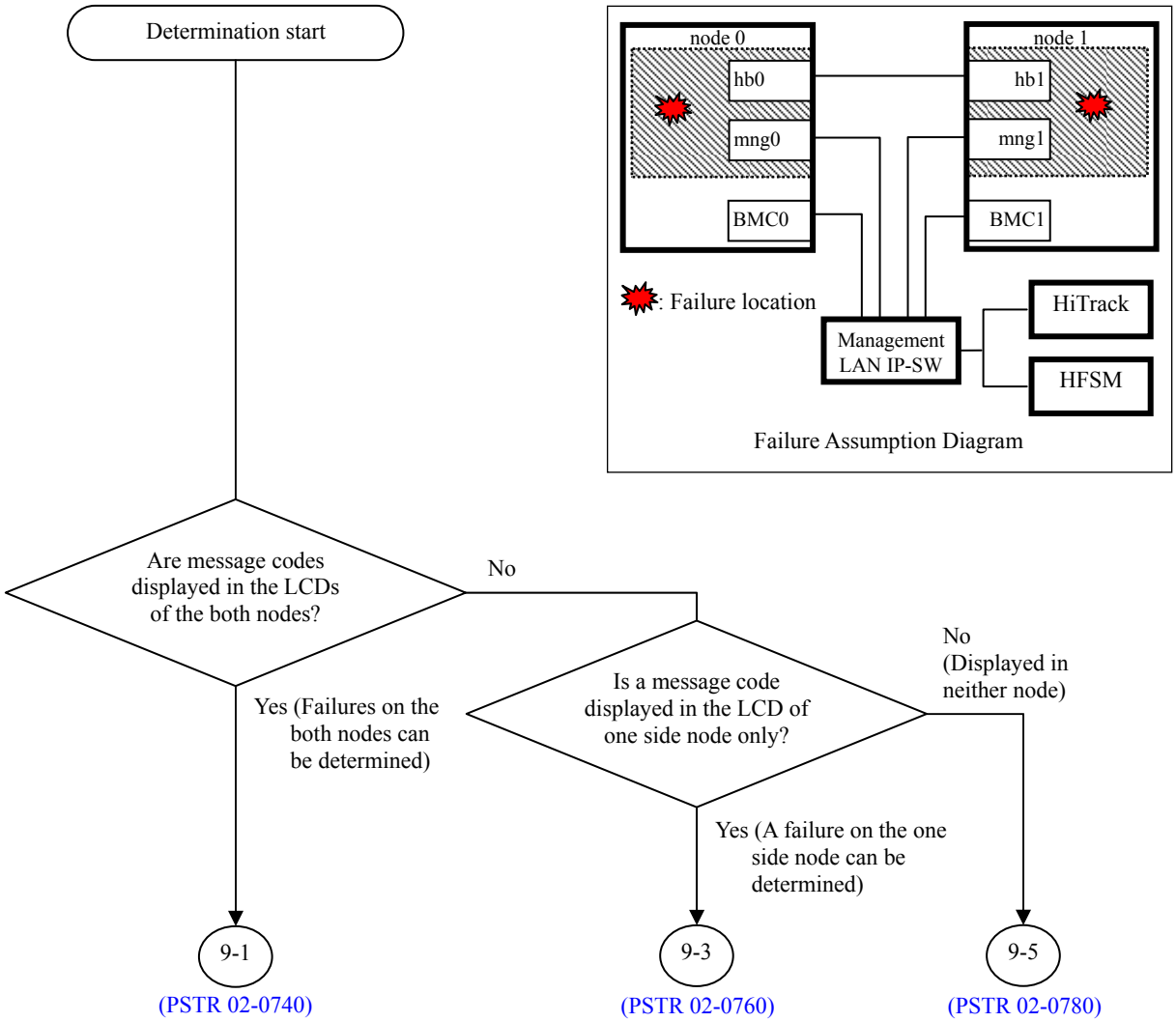

Figure C.2.3.2.2-9 Flow of Management Network Failure Determination (1/6)

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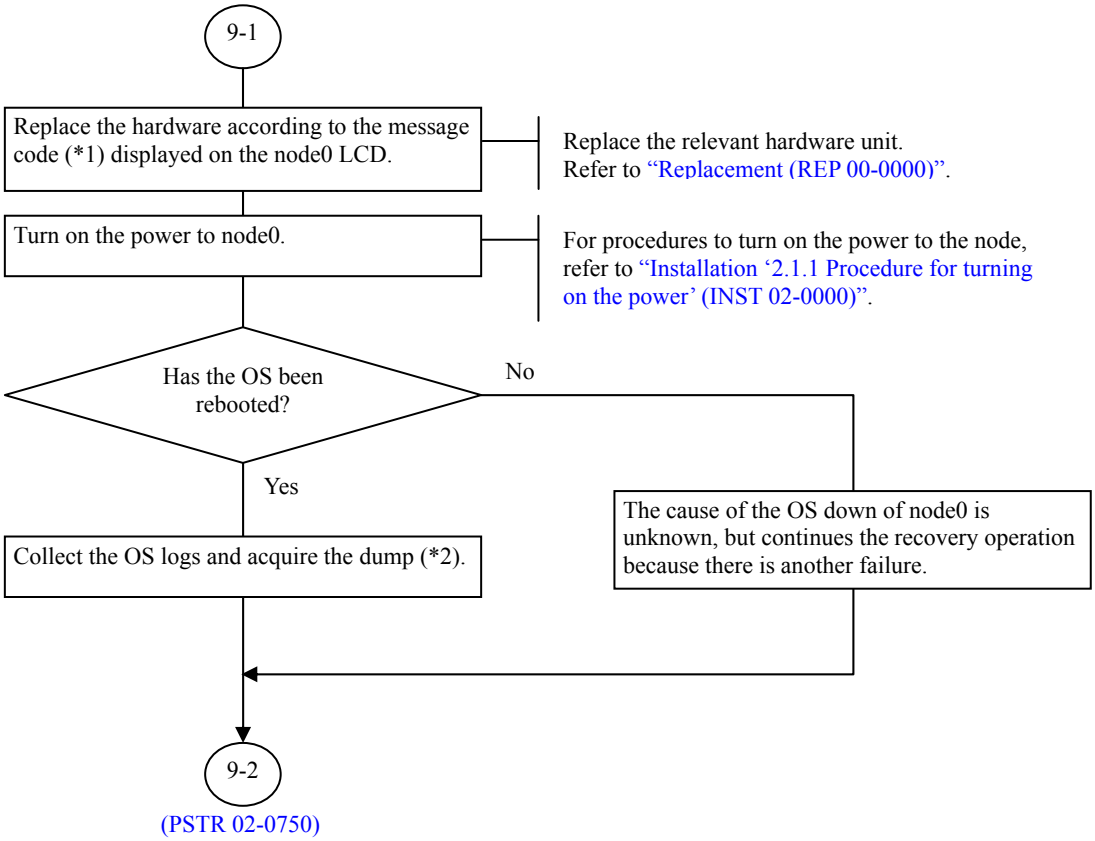

*1: If the LCD displayed in amber light, refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" provided by the hardware vendor, and check the message code starting from the letter "E" as shown in the right side table.

*2: Acquire the dump only when it exists.
For acquiring the log, refer to Troubleshooting "6.1.1 Acquiring log files" (TRBL 06-0000).
For acquiring the dump, refer to Troubleshooting "6.2.1 Collecting dump files" (TRBL 06-0010).

Message Code Displayed on LCD

#	Message code	Failed part
1	E122D / E2010 / E2011 / E2012 / E2013 / E201E / E2021 / E2023 / E2110 / E2111 / E2113	Memory
2	E1229 / E122A / E122C / E1414 / E1418 / E141C / E141F / E1420 / E1422 / E1717 / E2020	CPU
3	E1210	Motherboard
4	E1114 / E1116	Temperature abnormality
5	E1810 / E1812	Two embedded HDDs

Figure C.2.3.2.2-9 Flow of Management Network Failure Determination (2/6)

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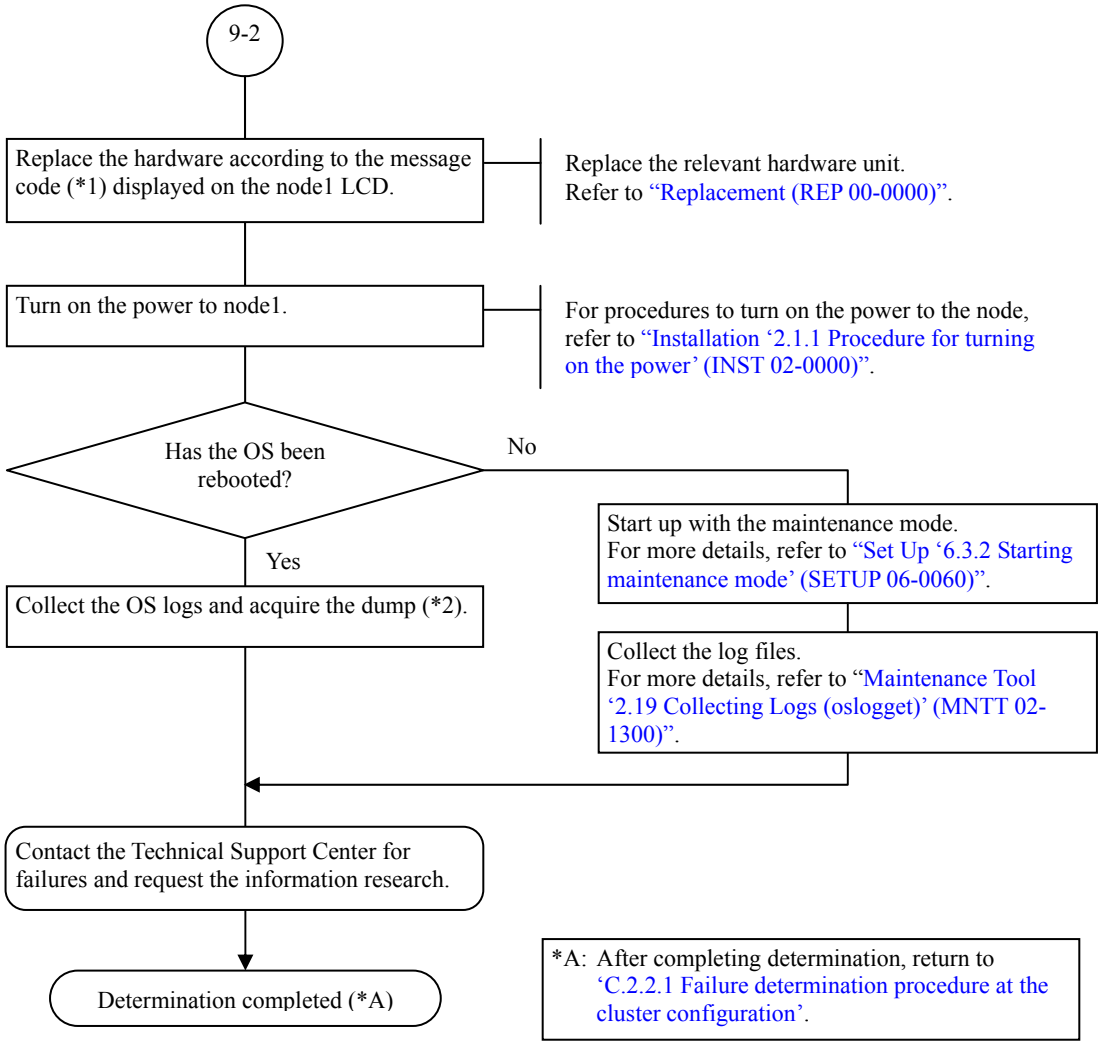

*1: If the LCD displayed in amber light, refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" provided by the hardware vendor, and check the message code starting from the letter "E" as shown in the right side table.

*2: Acquire the dump only when it exists.
For acquiring the log, refer to Troubleshooting "6.1.1 Acquiring log files" (TRBL 06-0000).
For acquiring the dump, refer to Troubleshooting "6.2.1 Collecting dump files" (TRBL 06-0010).

Message Code Displayed on LCD

#	Message code	Failed part
1	E122D / E2010 / E2011 / E2012 / E2013 / E201E / E2021 / E2023 / E2110 / E2111 / E2113	Memory
2	E1229 / E122A / E122C / E1414 / E1418 / E141C / E141F / E1420 / E1422 / E1717 / E2020	CPU
3	E1210	Motherboard
4	E1114 / E1116	Temperature abnormality
5	E1810 / E1812	Two embedded HDDs

Figure C.2.3.2.2-9 Flow of Management Network Failure Determination (3/6)

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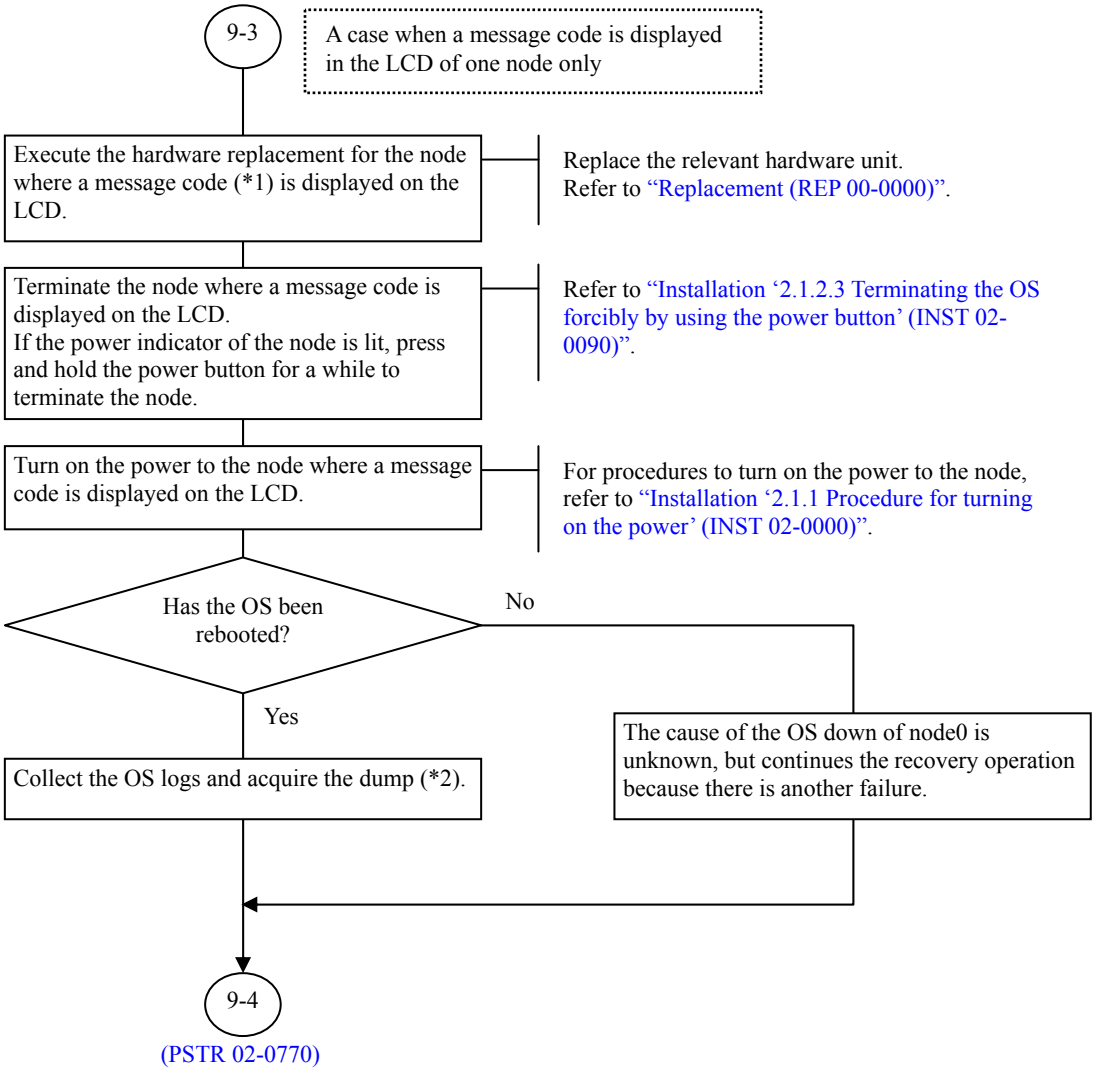

*1: If the LCD displayed in amber light, refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" provided by the hardware vendor, and check the message code starting from the letter "E" as shown in the right side table.

*2: Acquire the dump only when it exists.
For acquiring the log, refer to Troubleshooting "6.1.1 Acquiring log files" (TRBL 06-0000).
For acquiring the dump, refer to Troubleshooting "6.2.1 Collecting dump files" (TRBL 06-0010).

Message Code Displayed on LCD

#	Message code	Failed part
1	E122D / E2010 / E2011 / E2012 / E2013 / E201E / E2021 / E2023 / E2110 / E2111 / E2113	Memory
2	E1229 / E122A / E122C / E1414 / E1418 / E141C / E141F / E1420 / E1422 / E1717 / E2020	CPU
3	E1210	Motherboard
4	E1114 / E1116	Temperature abnormality
5	E1810 / E1812	Two embedded HDDs

Figure C.2.3.2.2-9 Flow of Management Network Failure Determination (4/6)

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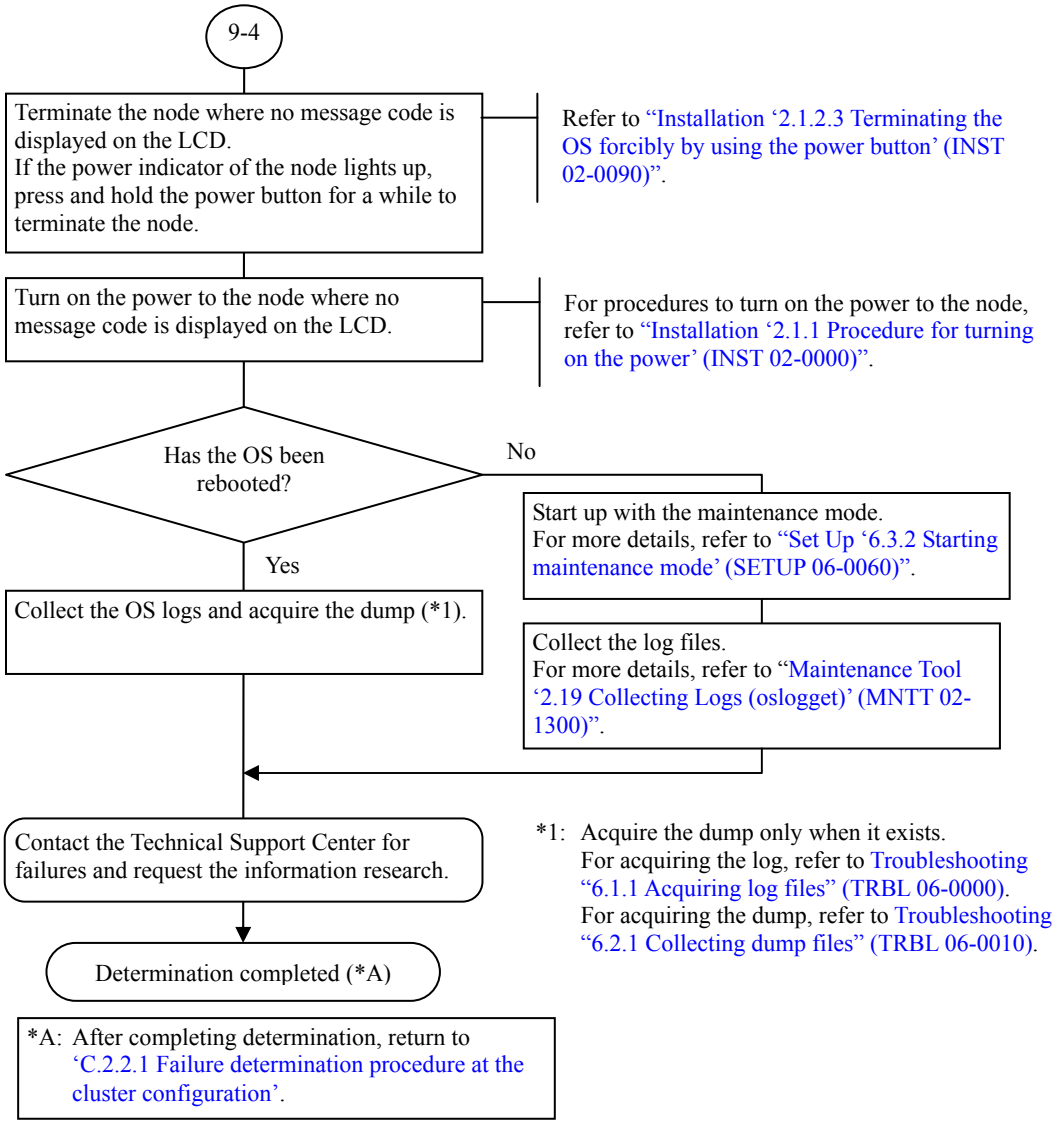

Figure C.2.3.2.2-9 Flow of Management Network Failure Determination (5/6)

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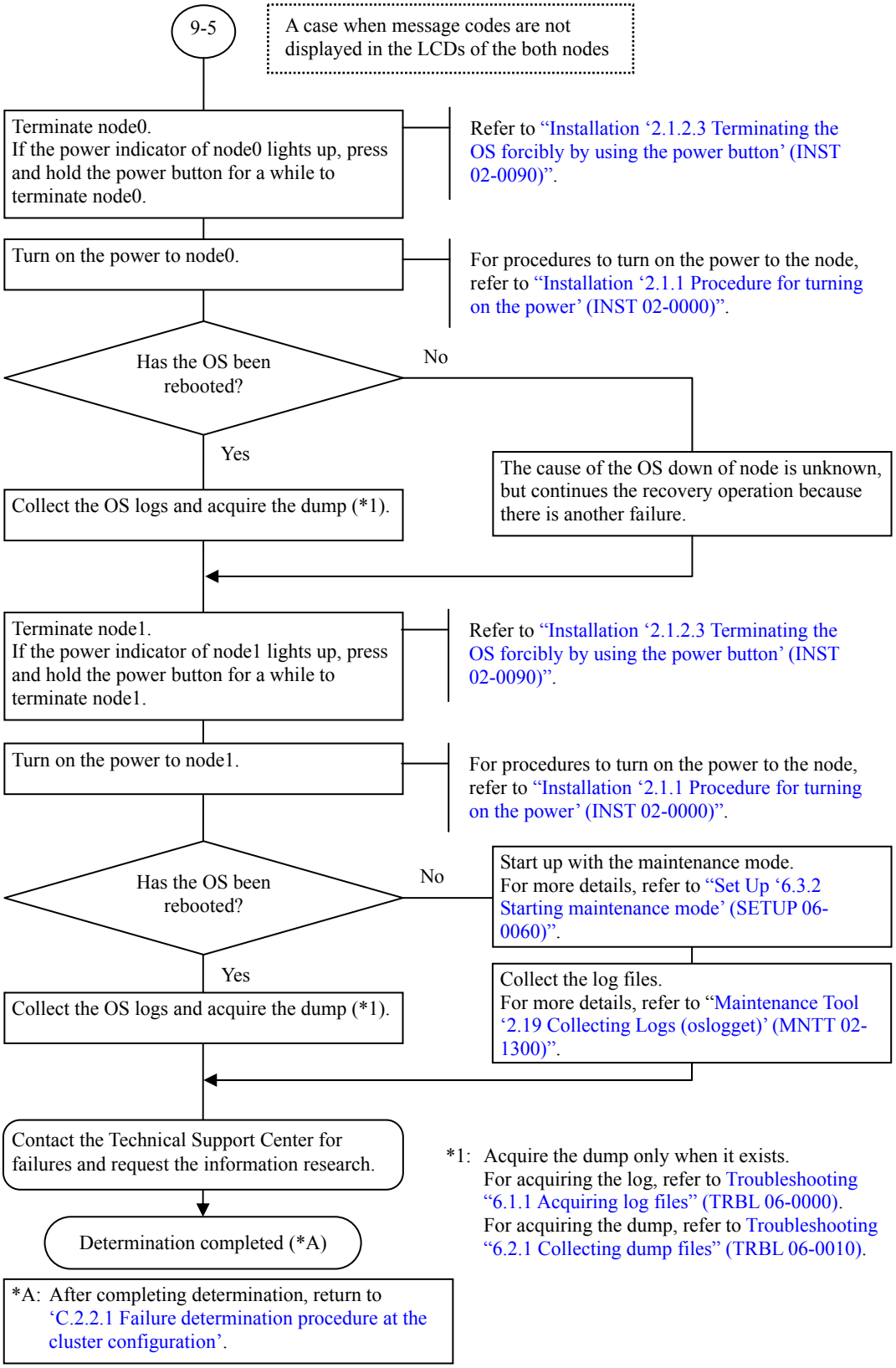

Figure C.2.3.2.2-9 Flow of Management Network Failure Determination (6/6)

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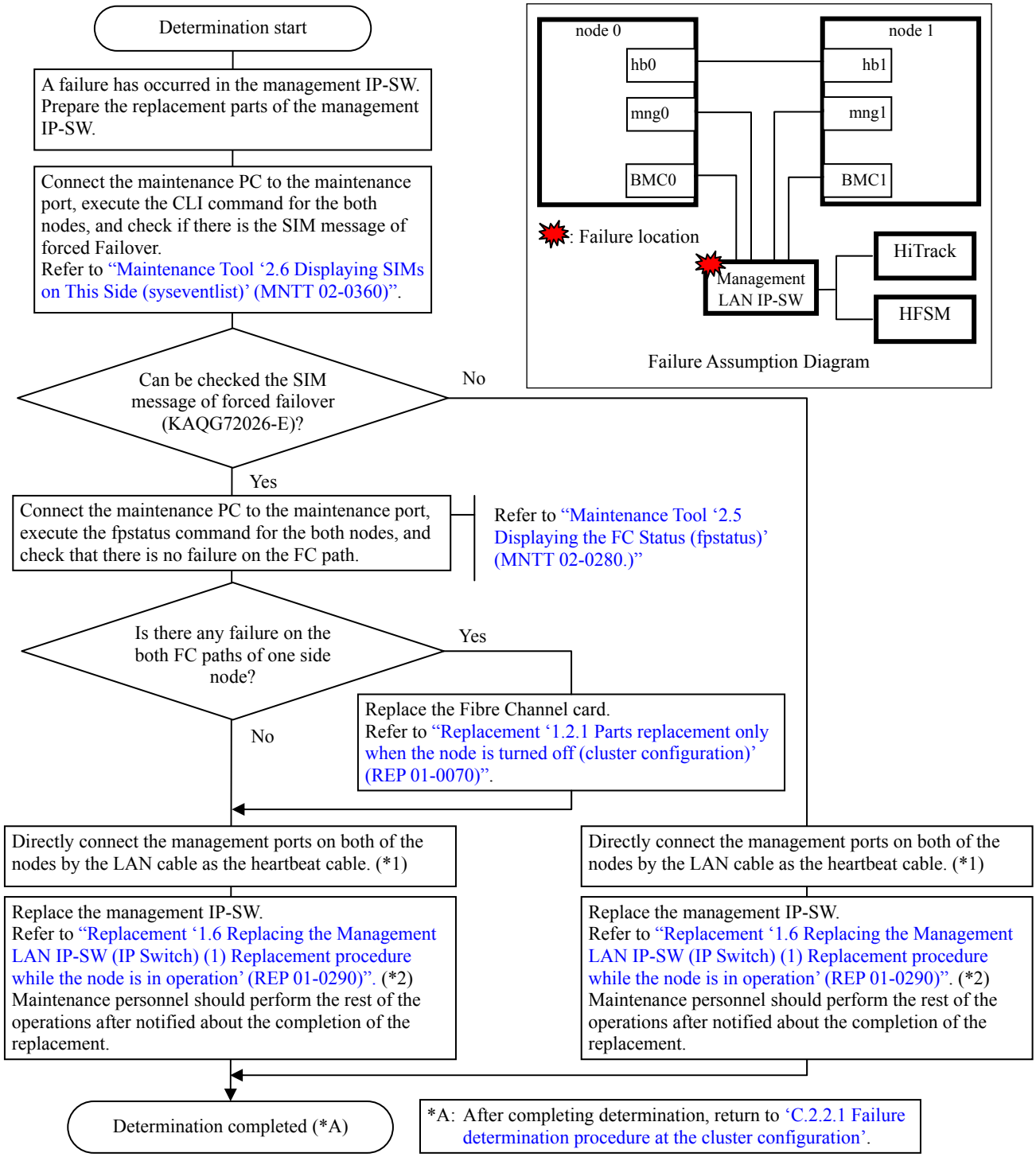
(10) Failure in the management IP-SW



*1: Remove the LAN cable connecting between the management port on the node 0 and the management LAN IP-SW from the management LAN IP-SW, and then connect to the management port on the node 1.

*2: Before executing the procedure (1-3) (c) that is described in the "Replacement '1.6 Replacing the Management LAN IP-SW (IP Switch) (1) Replacement procedure while the node is in operation' (REP 01-0290)", the other side node of the node where the SIM message of forced failover is confirmed is reset. After confirming the startup of the other side node, execute the procedure (1-3) (c) and later.

Figure C.2.3.2.2-10 Flow of Management Network Failure Determination

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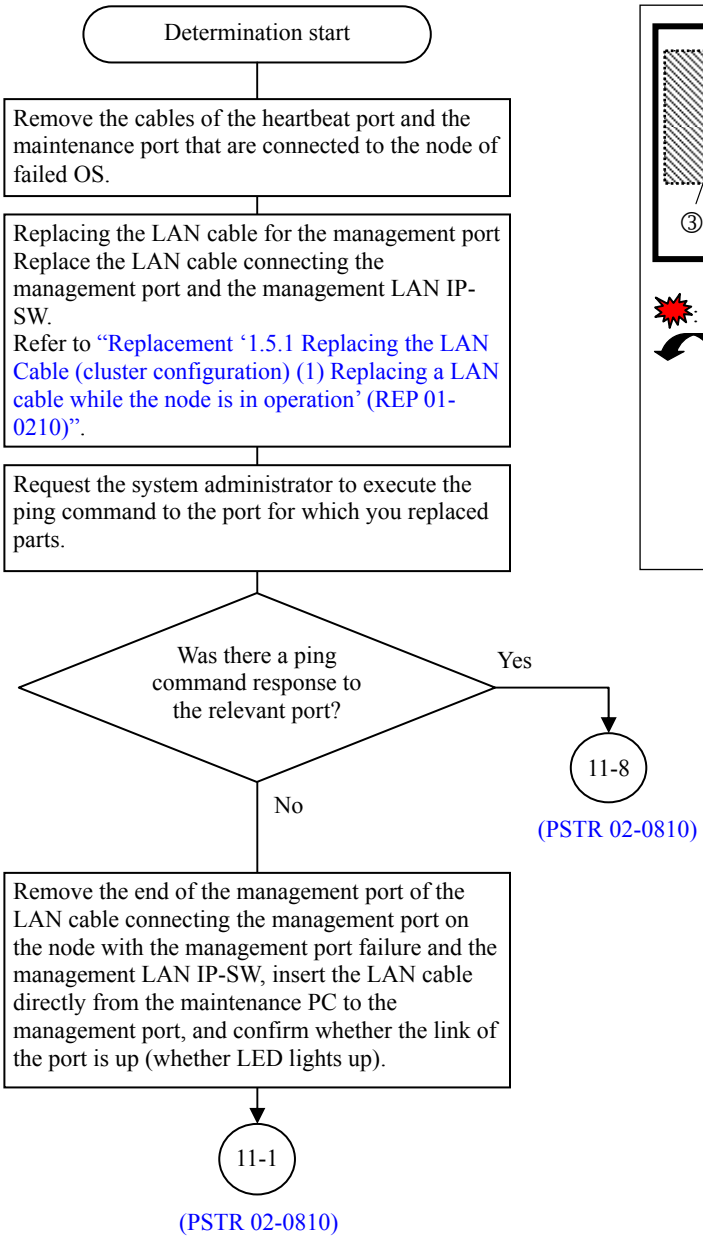
(11) The service is stopped in the both nodes due to OS down, after the failover occurred by the failure on the maintenance port.



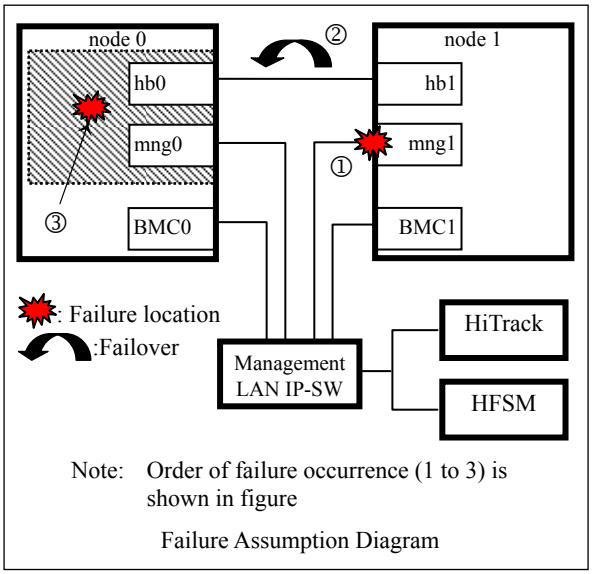


Figure C.2.3.2.2-11 Flow of Management Network Failure Determination (1/6)

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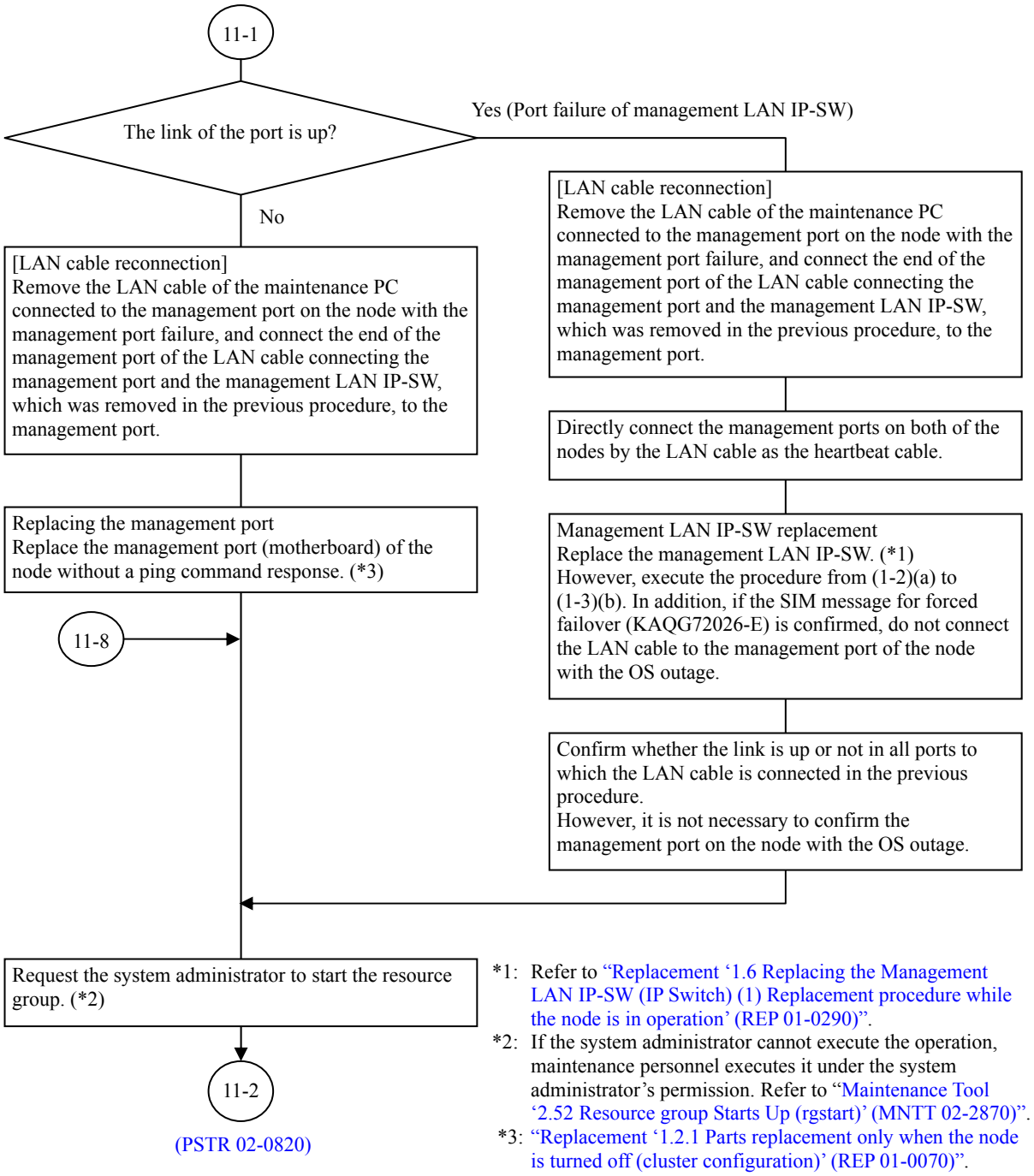

Figure C.2.3.2.2-11 Flow of Management Network Failure Determination (2/6)

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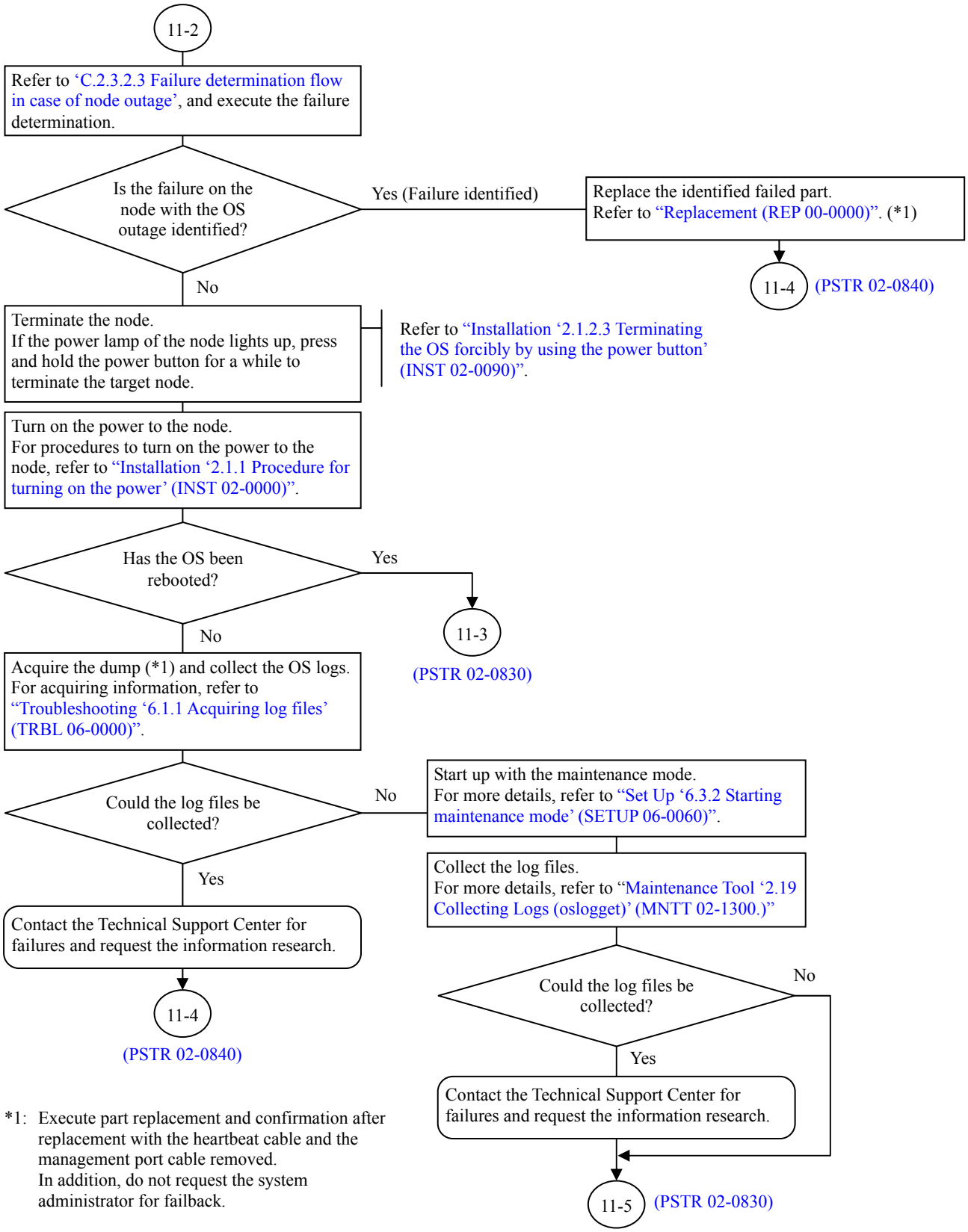

*1: Execute part replacement and confirmation after replacement with the heartbeat cable and the management port cable removed.
In addition, do not request the system administrator for failback.

Figure C.2.3.2.2-11 Flow of Management Network Failure Determination (3/6)

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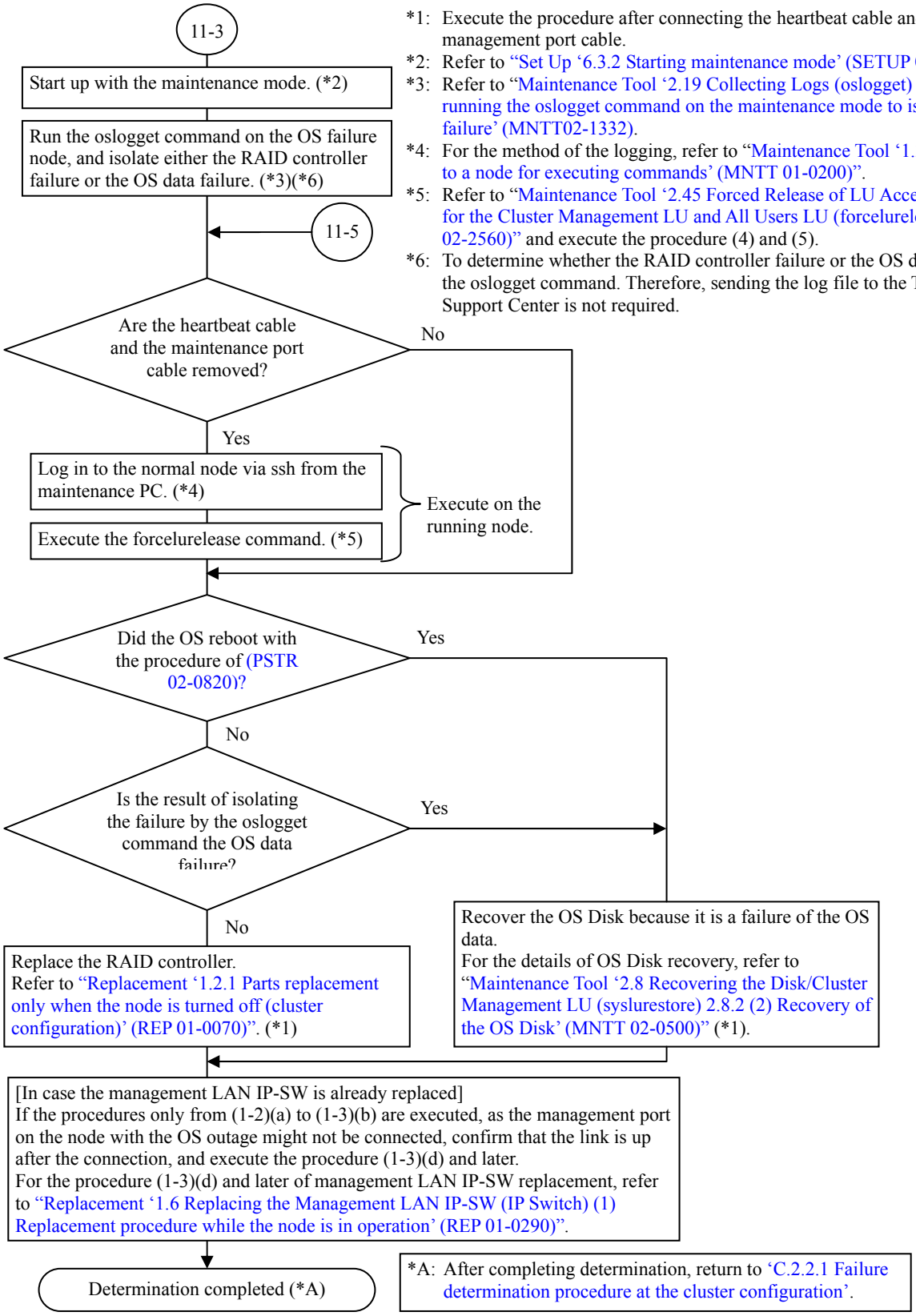

*1: Execute the procedure after connecting the heartbeat cable and the management port cable.
*2: Refer to "Set Up '6.3.2 Starting maintenance mode' (SETUP 06-0060)".
*3: Refer to "Maintenance Tool '2.19 Collecting Logs (oslogget) (3) When running the oslogget command on the maintenance mode to isolate the failure' (MNTT02-1332).
*4: For the method of the logging, refer to "Maintenance Tool '1.3.2 Logging in to a node for executing commands' (MNTT 01-0200)".
*5: Refer to "Maintenance Tool '2.45 Forced Release of LU Access Protection for the Cluster Management LU and All Users LU (forcelurelease)' (MNTT 02-2560)" and execute the procedure (4) and (5).
*6: To determine whether the RAID controller failure or the OS data failure, run the oslogget command. Therefore, sending the log file to the Technical Support Center is not required.

*A: After completing determination, return to 'C.2.2.1 Failure determination procedure at the cluster configuration'.

Figure C.2.3.2.2-11 Flow of Management Network Failure Determination (4/6)

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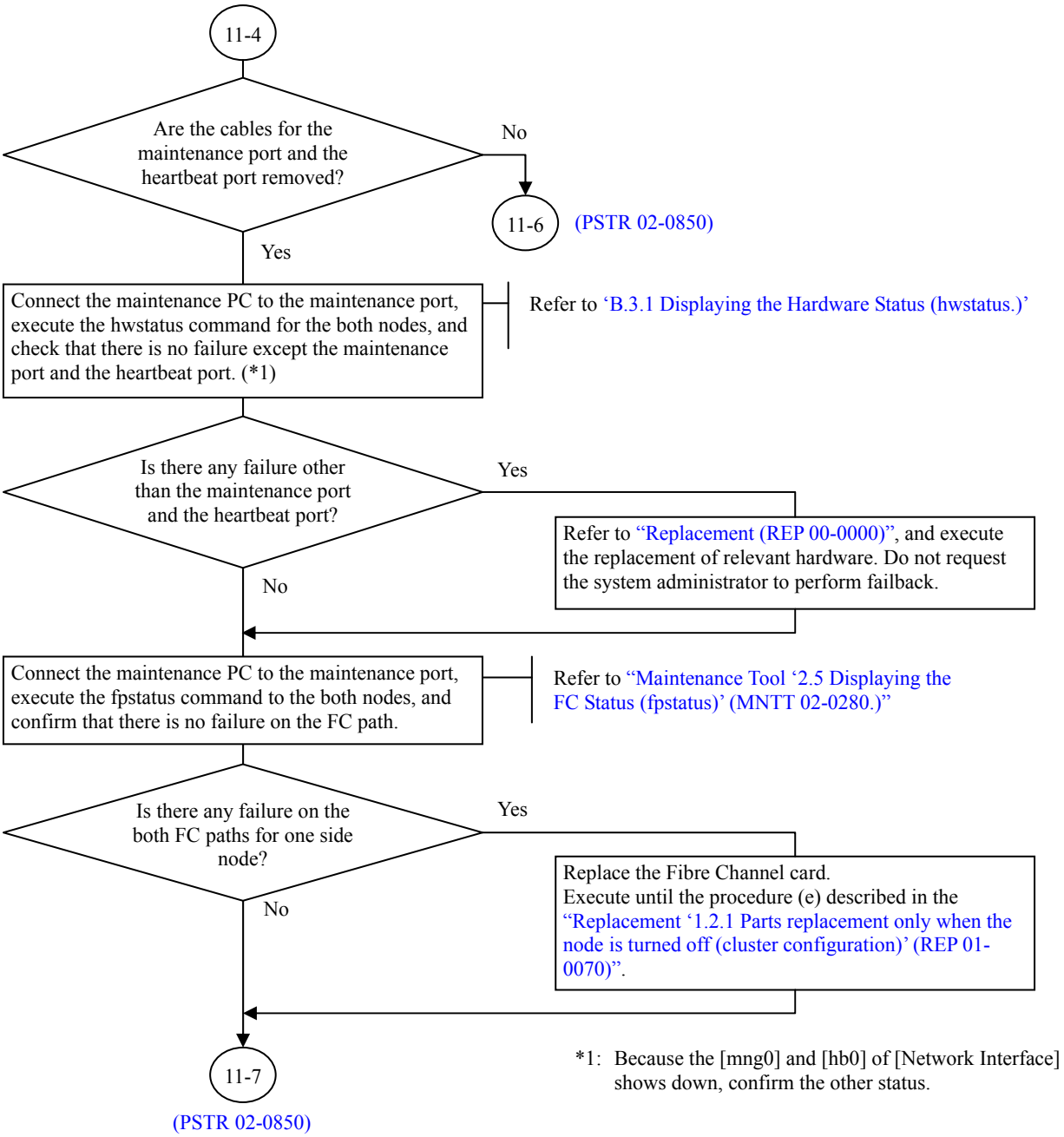

Figure C.2.3.2.2-11 Flow of Management Network Failure Determination (5/6)

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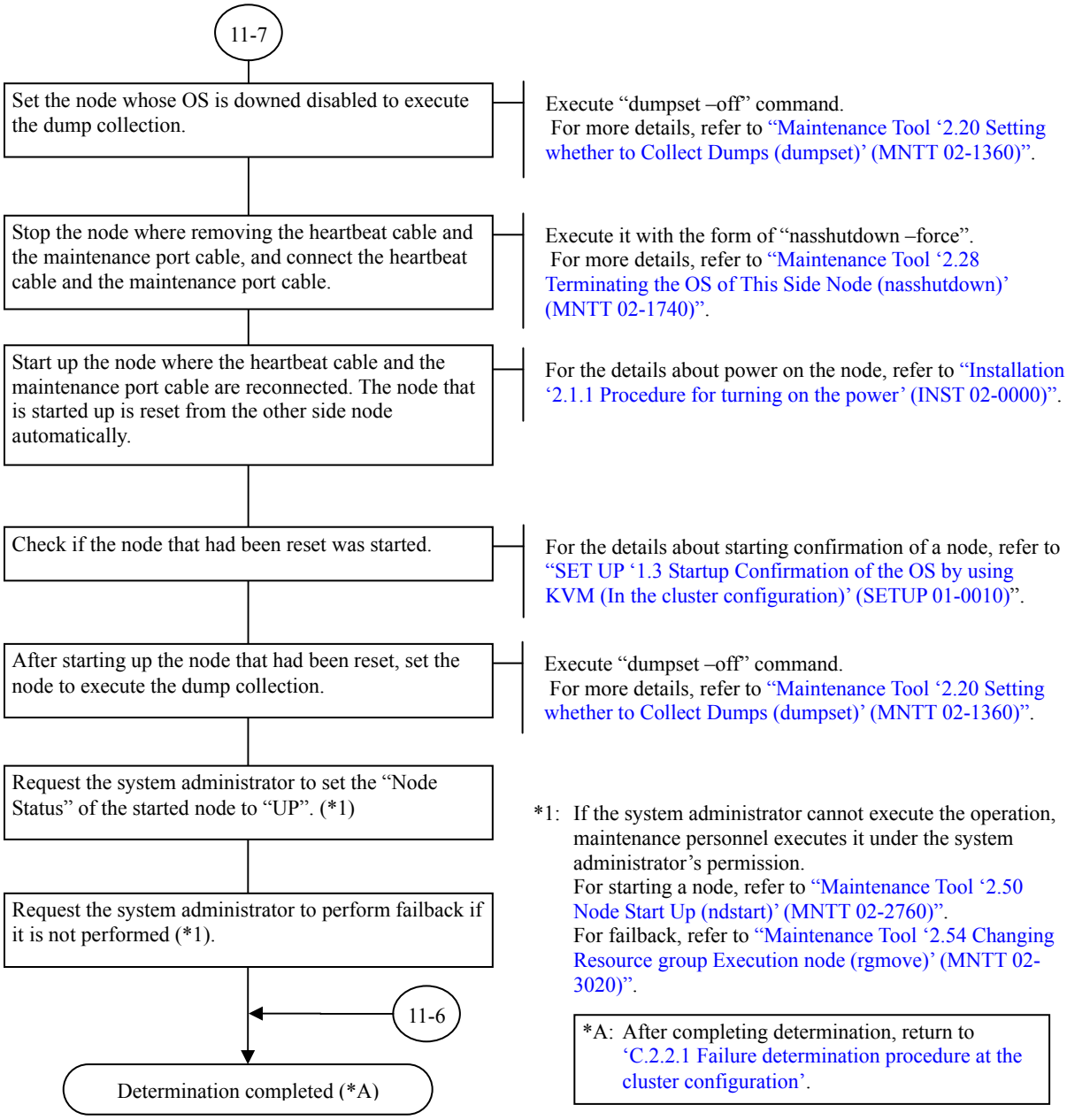

Figure C.2.3.2.2-11 Flow of Management Network Failure Determination (6/6)

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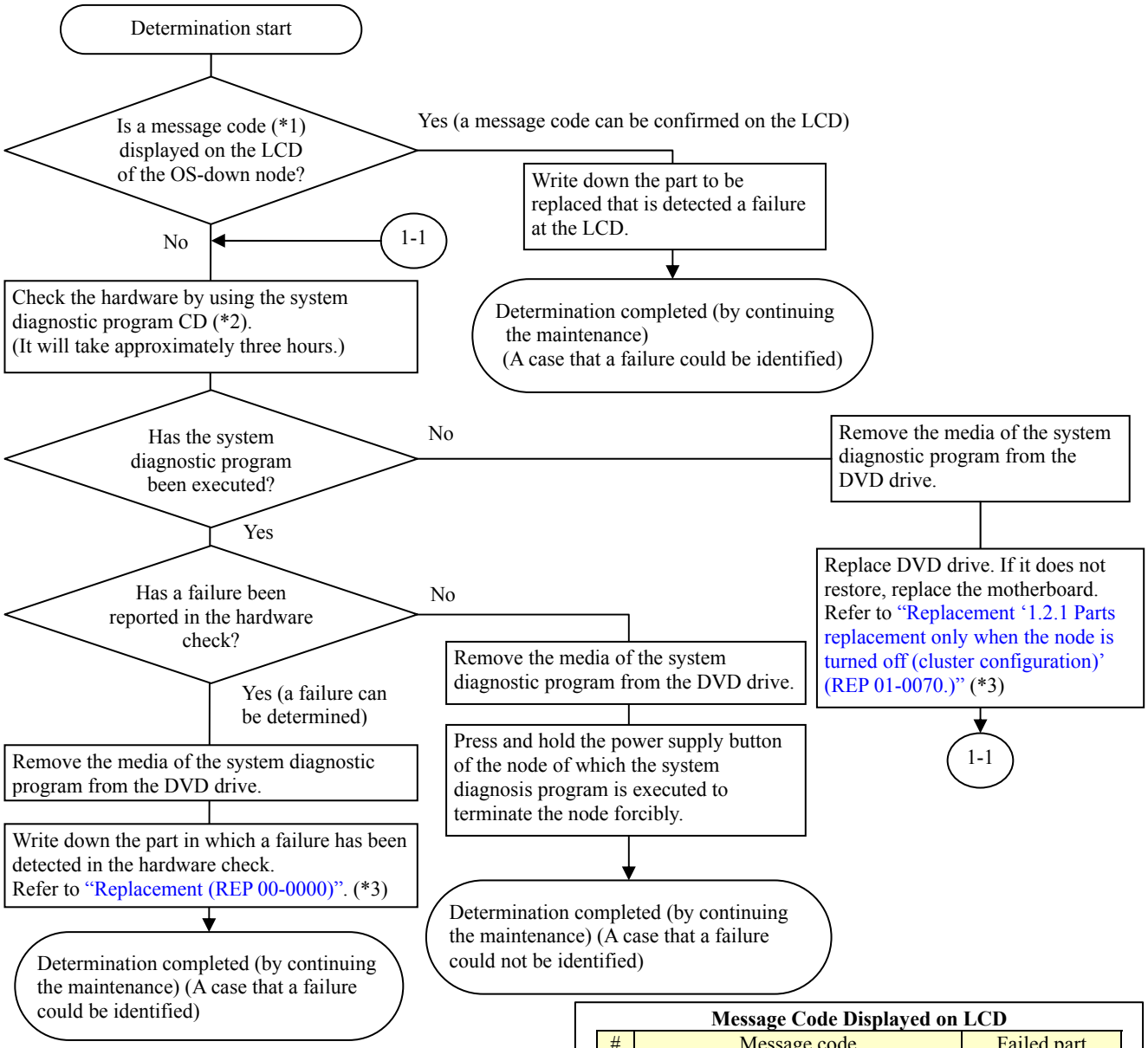
C.2.3.2.3 Failure determination flow in case of node outage



*1: If the LCD displayed in amber light, refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" provided by the hardware vendor, and check the message code starting from the letter "E" as shown in the right side table.

*2: For the detailed of the system diagnostic program, refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" provided by the hardware vendor. Select Custom Test for an option, and then select all the devices.

*3: If the heartbeat cable or the management port cable is removed, go on to the procedures of the parts replacement and the confirmation after the replacement. In this case, do not request the system administrator to perform failback.

Message Code Displayed on LCD

#	Message code	Failed part
1	E122D / E2010 / E2011 / E2012 / E2013 / E201E / E2021 / E2023 / E2110 / E2111 / E2113	Memory
2	E1229 / E122A / E122C / E1414 / E1418 / E141C / E141F / E1420 / E1422 / E1717 / E2020	CPU
3	E1210	Motherboard
4	E1114 / E1116	Temperature abnormality
5	E1810 / E1812	Two embedded HDDs

Figure C.2.3.2.3-1 Failure Determination Flow in Case of Node Outage

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C.2.3.3 Determining the node failure when no failover occurs

The failure determination and the failed part when SIM of failover is not displayed are described.

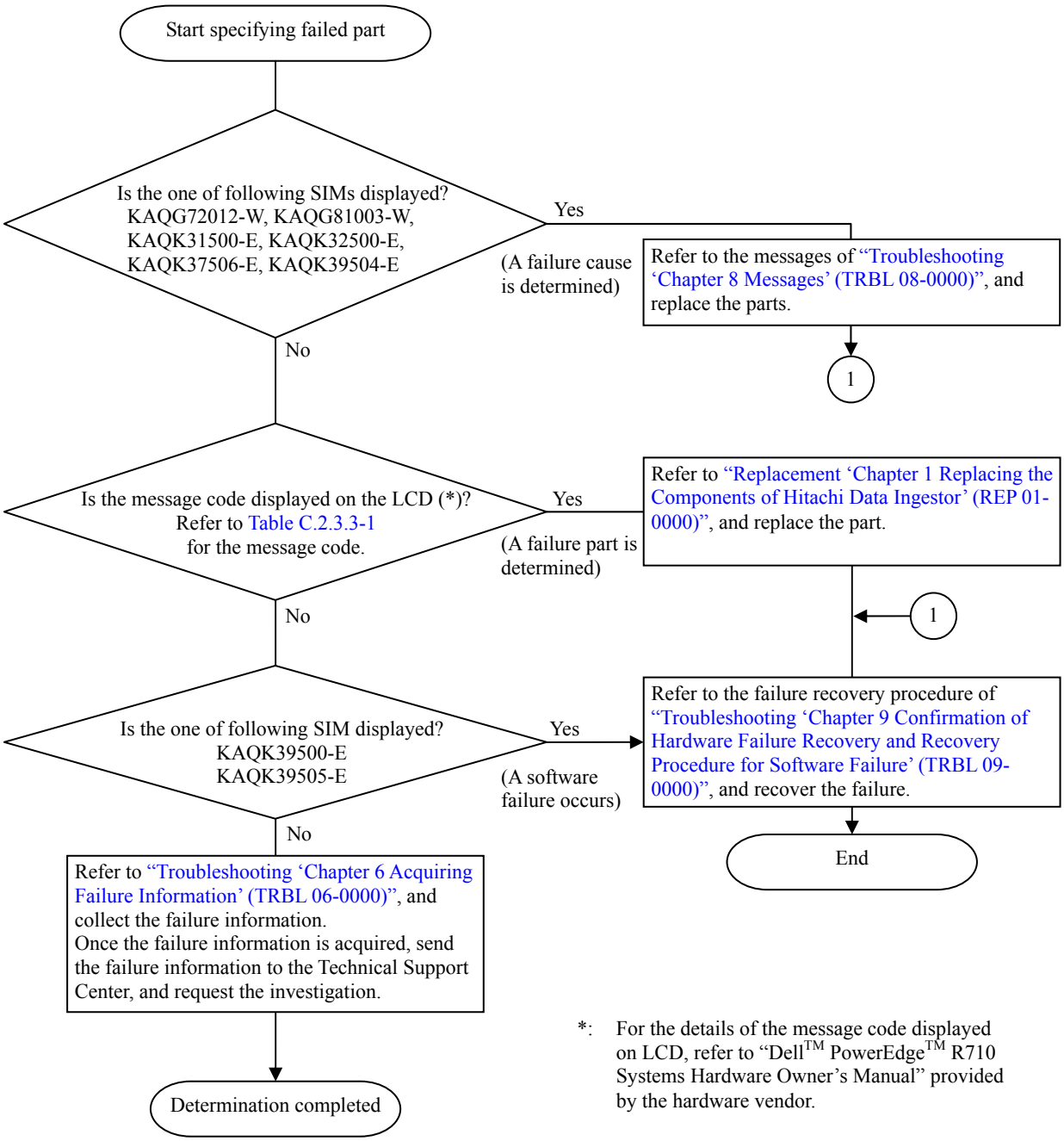

Figure C.2.3.3-1 Determining the node failure when failover has not occurred

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Table C.2.3.3-1 Failed parts shown by SIM or LCD

#	SIM	Display of LCD status or message code (*1)	LED status	Checking the status by the hwstatus command (*2)	Failed part
1	KAQG72012-W	—	—	—	Heartbeat LAN port or Heartbeat LAN cable (*3) (*4)
2	KAQG81003-W	—	—	Is the port status “Link down”?	Extension NIC port or cable (*3)
3	KAQK31500-E	Lighting in amber E1610 E1614 E1618 E161C E1620 E1624 E1626 E1629	—	Is the power supply status “failed”?	One power supply unit
4	KAQK32500-E	E1310 E1311 E1313	—	Is the FAN status “failed”?	One FAN
5	KAQK37506-E	E1810	The LED indication on the embedded HDD blinks in yellow four times in one second.	Is the embedded HDD status “failed”?	One embedded HDD
6	KAQK39504-E	—	—	Is the status of all ports of NIC “Link down”?	
7	—	E1211 E1228	—	Is the battery status “failed”?	Embedded battery

*1: If the LCD displayed in amber light, refer to “Dell™ PowerEdge™ R710 Systems Hardware Owner’s Manual” provided by the hardware vendor, and check the message code starting from the letter “E” as shown in the above table.
*2: For the hwstatus command, refer to ‘B.3.1 Displaying the Hardware Status (hwstatus)’.
*3: When it is not recovered even if the cable is replaced, it is a port failure.
*4: In case of a port failure, ping from the management PC or maintenance PC, and specify which of the nodes has the port failure.

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C.2.3.4 Determining the node failure when failover occurred

The failure determination and the failed part when SIM of failover is displayed are described.

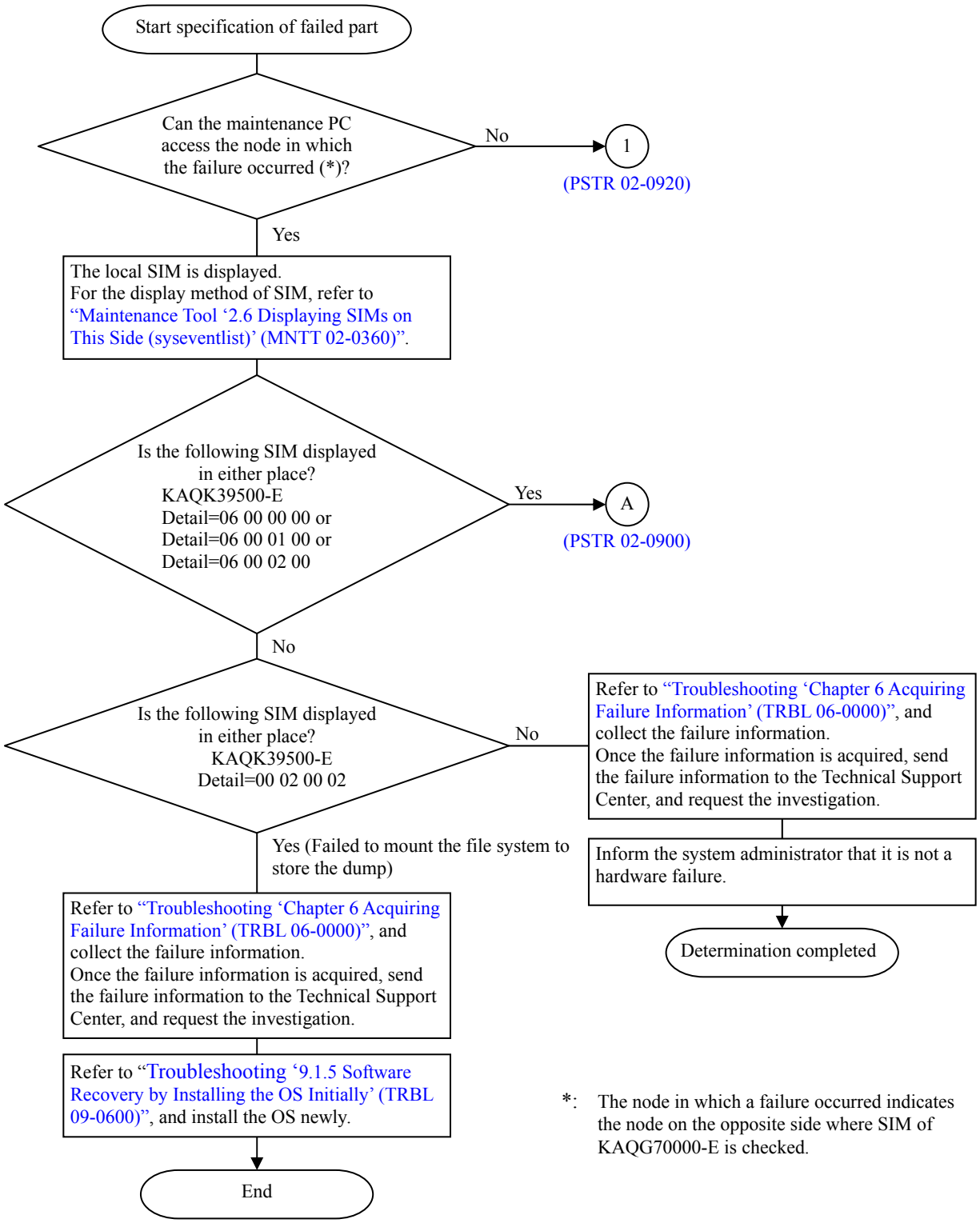

Figure C.2.3.4-1 Determining the node failure when failover occurred (1/7)

Copyright © 2011, 2013, Hitachi, Ltd.

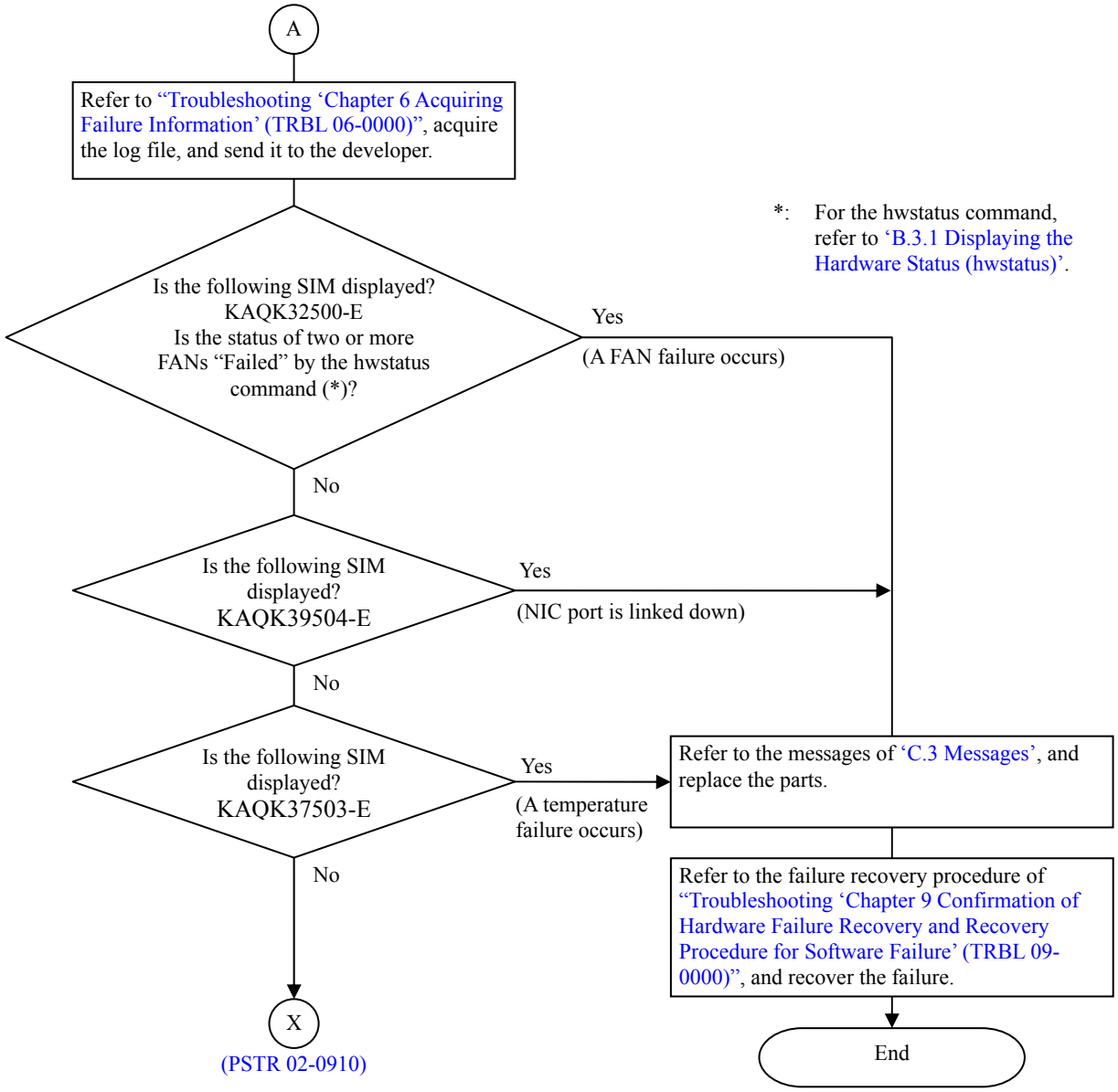

Figure C.2.3.4-1 Determining the node failure when failover occurred (2/7)

Copyright © 2011, 2013, Hitachi, Ltd.

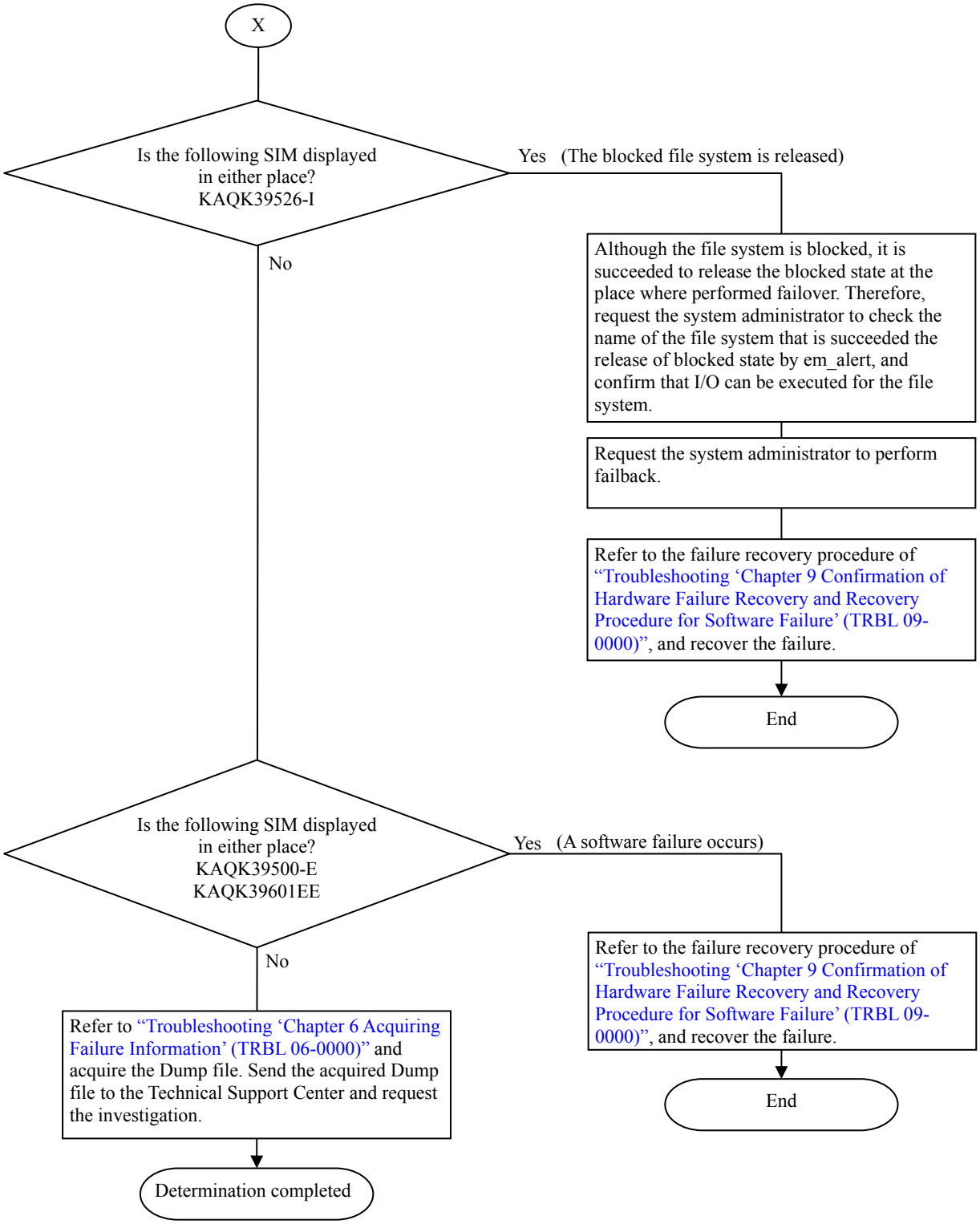

Figure C.2.3.4-1 Determining the node failure when failover occurred (3/7)

Copyright © 2011, 2013, Hitachi, Ltd.

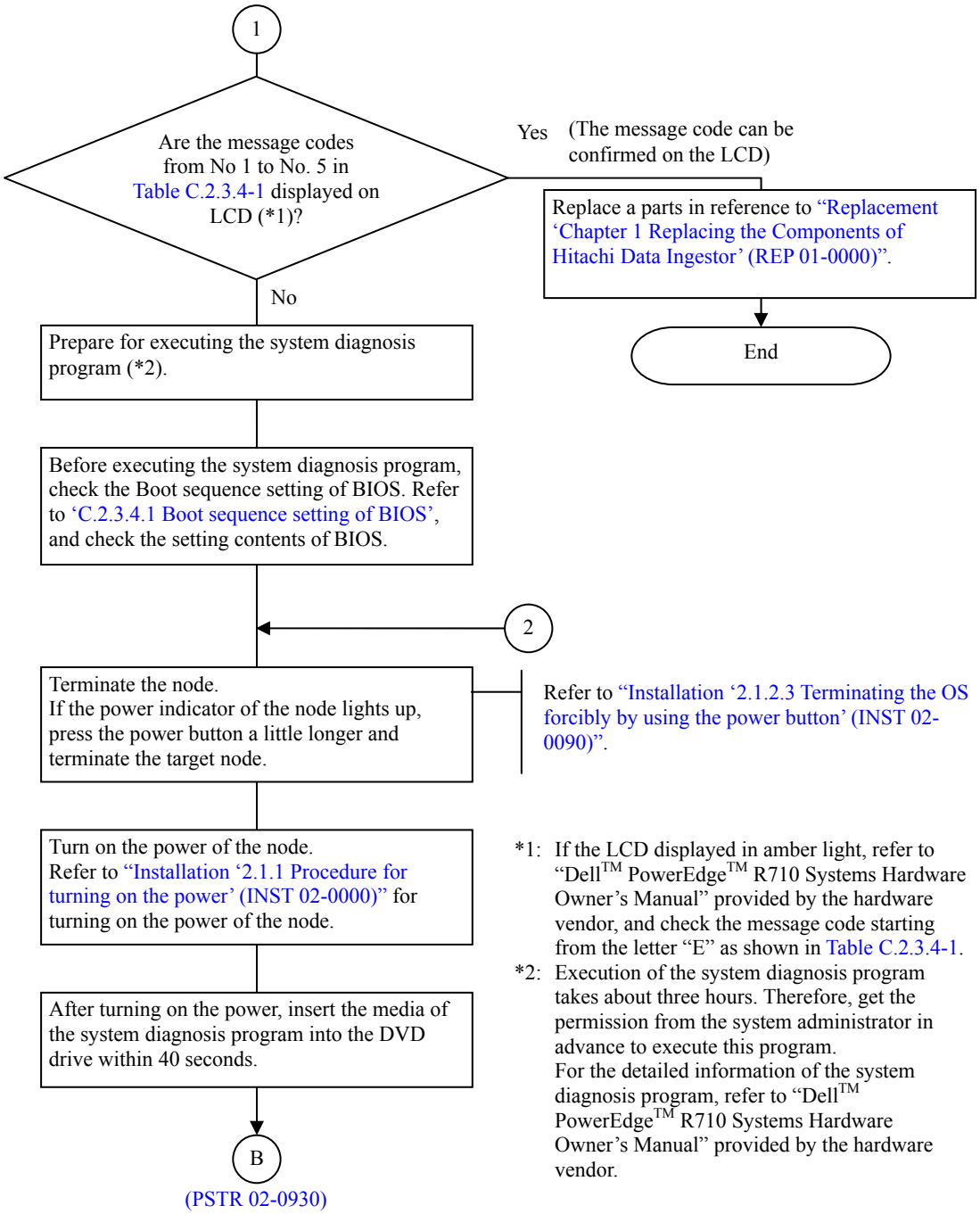

Figure C.2.3.4-1 Determining the node failure when failover occurred (4/7)

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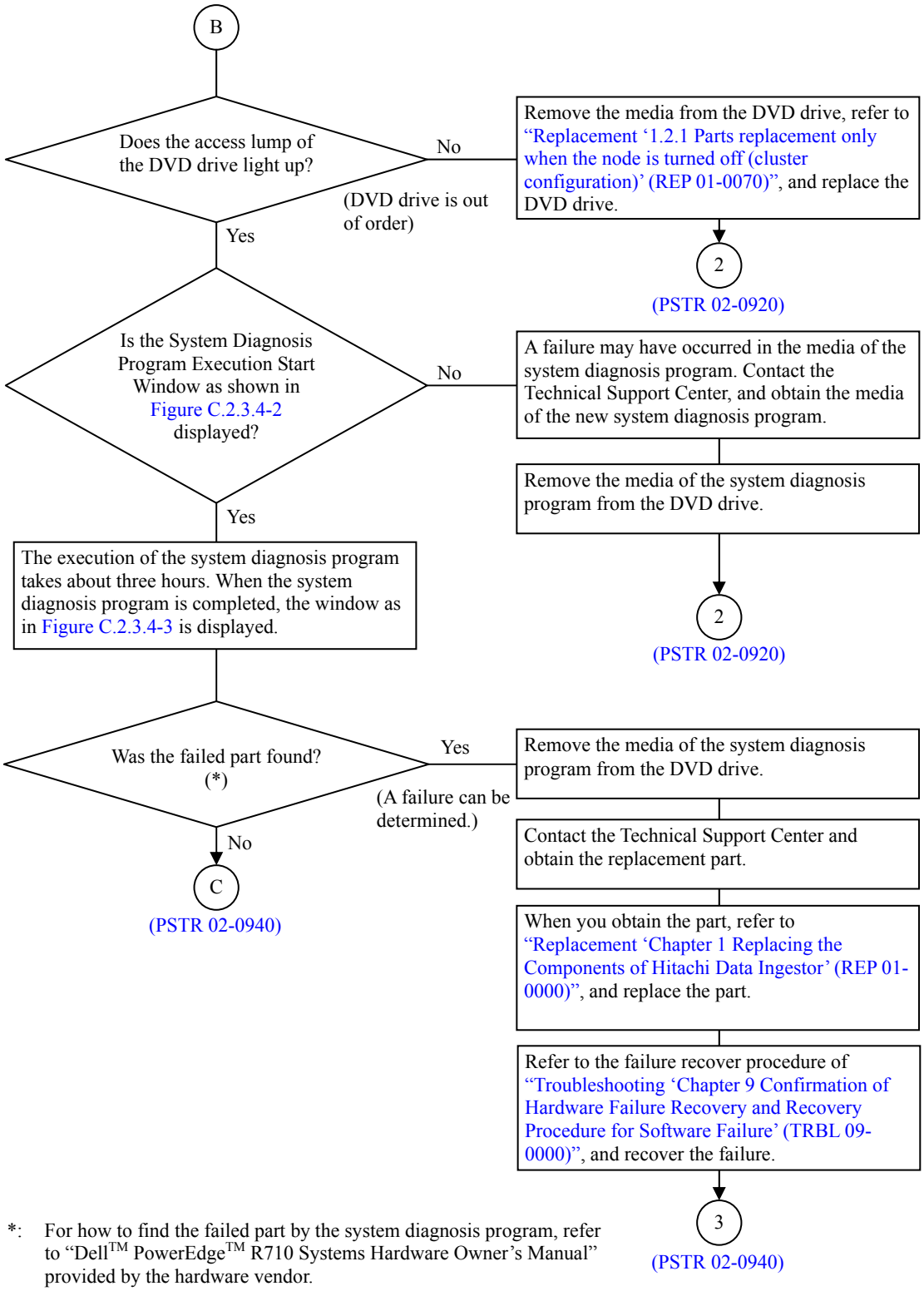

*: For how to find the failed part by the system diagnosis program, refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" provided by the hardware vendor.
Select "Custom Test" as an option, and execute it by selecting all the devices.

Figure C.2.3.4-1 Determining the node failure when failover occurred (5/7)

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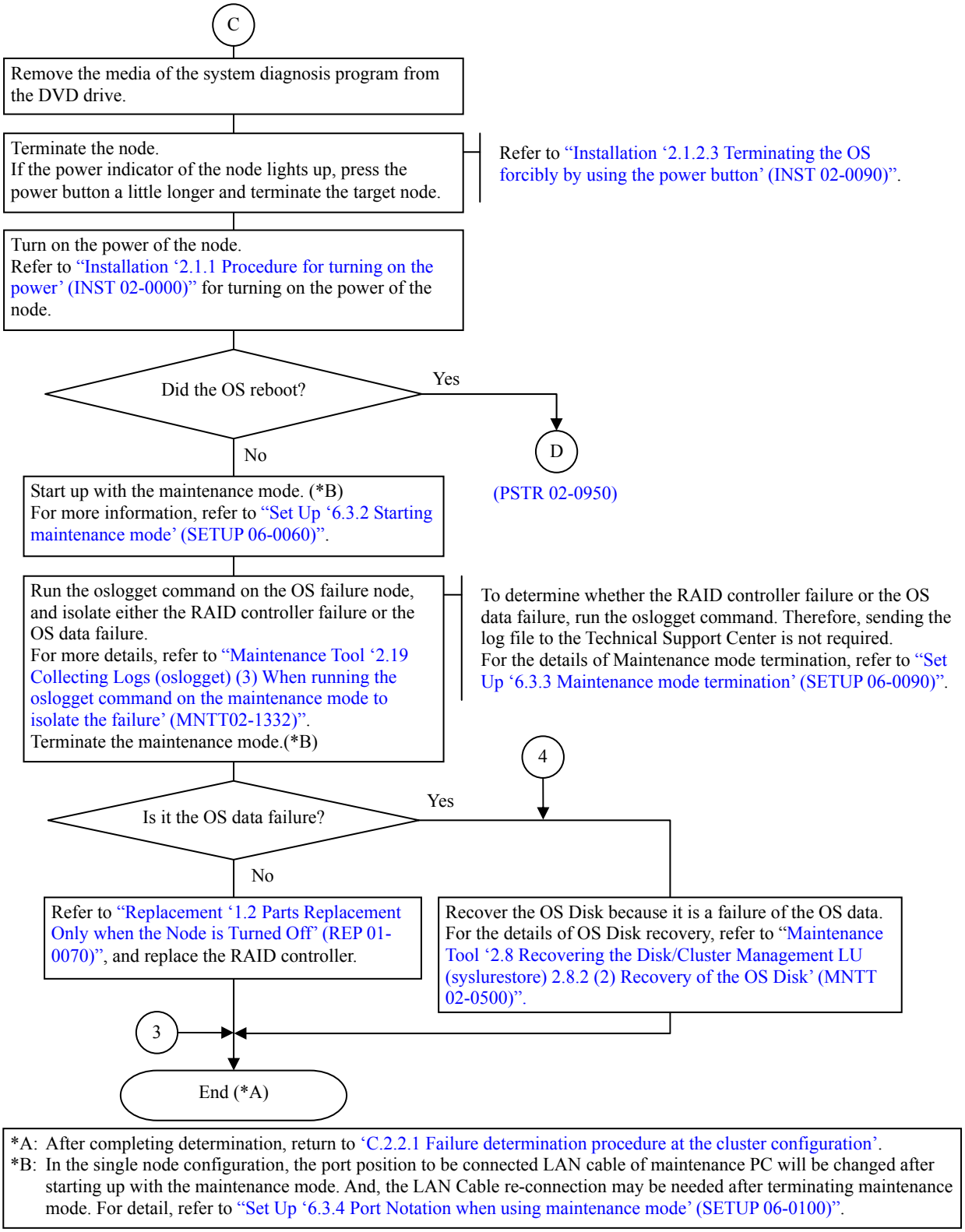

*A: After completing determination, return to 'C.2.2.1 Failure determination procedure at the cluster configuration'.
*B: In the single node configuration, the port position to be connected LAN cable of maintenance PC will be changed after starting up with the maintenance mode. And, the LAN Cable re-connection may be needed after terminating maintenance mode. For detail, refer to "Set Up '6.3.4 Port Notation when using maintenance mode' (SETUP 06-0100)".

Figure C.2.3.4-1 Determining the node failure when failover occurred (6/7)

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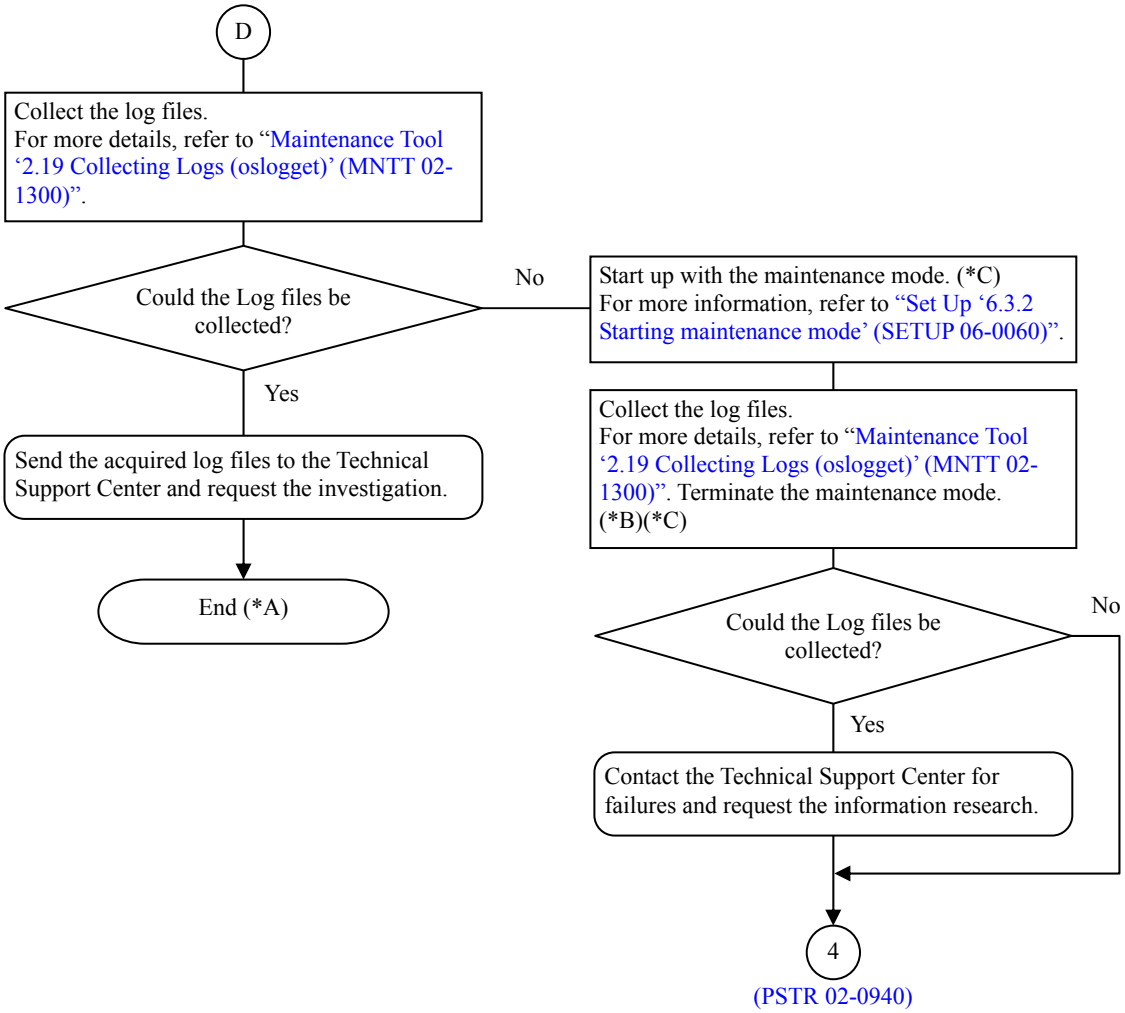

*A: After completing determination, return to 'C.2.2.1 Failure determination procedure at the cluster configuration'.
*B: For the details of Maintenance mode termination, refer to "SETUP '6.3.3 Maintenance mode termination' (SETUP 06-0090)".
*C: In the single node configuration, the port position to be connected LAN cable of maintenance PC will be changed after starting up with the maintenance mode. And, the LAN Cable re-connection may be needed after terminating maintenance mode.
For detail, refer to "Set Up '6.3.4 Port Notation when using maintenance mode' (SETUP 06-0100)".

Figure C.2.3.4-1 Determining the node failure when failover occurred (7/7)

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Table C.2.3.4-1 Failed Parts by LCD

#	Display of message codes	Failed parts
1	E122D E2010 E2011 E2012 E2013 E201E E2021 E2023 E2110 E2111 E2113	Memory
2	E1229 E122A E122C E1414 E1418 E141C E141F E1420 E1422 E1717 E2020	CPU
3	E1210	Motherboard
4	E1114 E1116	Abnormal temperature
5	E1810 E1812	Two embedded HDDs

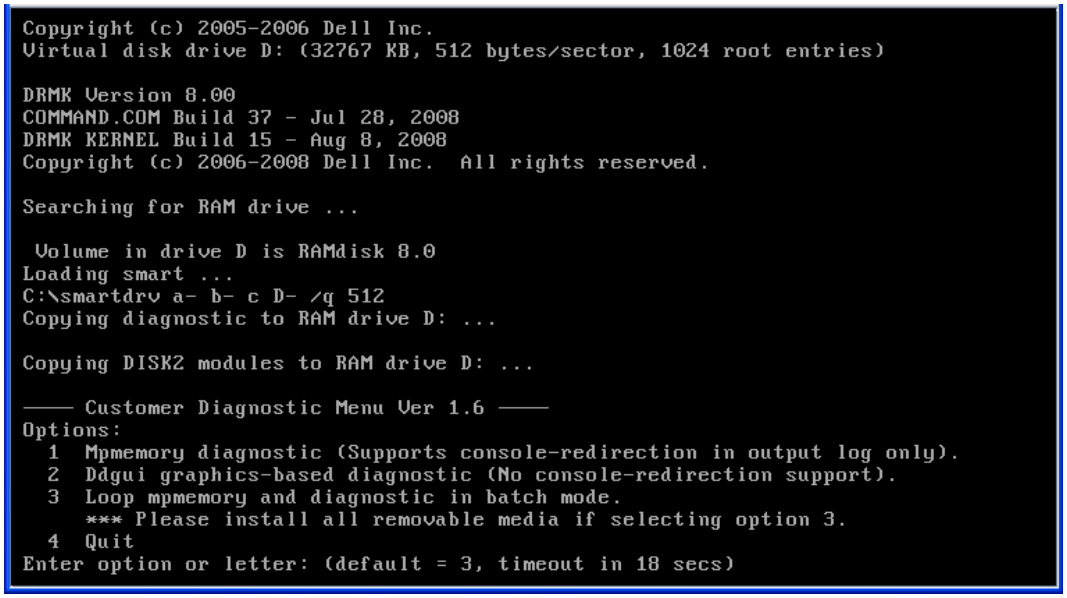

Figure C.2.3.4-2 System Diagnosis Program Execution Start Window

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```
Test Results : Pass

** Serial Port 1 - Interrupt Test **
Test Results : Pass

** Serial Port 1 - Internal Transmit Test **
Test Results : Pass

** Serial Port 2 - Baud Rate Test **
Test Results : Pass

** Serial Port 2 - Interrupt Test **
Test Results : Pass

** Serial Port 2 - Internal Transmit Test **
Test Results : Pass

** SATA DVD-ROM 0 - Confidence Test **
Performing the drive's internal self-test
Performing a read test at the beginning of the media
Performing a read test at the end of the media
Test Results : Pass

** SATA DVD-ROM 0 - Built In Self Test (Test All) **
Performing OBIST DRAM test
Performing OBIST Controller test
Performing OBIST Flash test
Test Results : Pass

** PERC6 0-0 Ctlr - SCSI Controller Test **
Test Results : Pass

** SAS 0-000 Disk S/N:3QN2E29N - Confidence Test **
Performing the drive's internal self test
Performing a read test at the beginning of the media
Performing a read test at the end of the media
Performing random seeks in the middle of the media
Test Results : Pass

Performing surface scan of the remainder of the media
---- Customer Diagnostic Menu Ver 1.6 ----
Options:
  1  Mpmemory diagnostic (Supports console-redirection in output log only).
  2  Dagui graphics-based diagnostic (No console-redirection support).
  3  Loop mpmemory and diagnostic in batch mode.
     *** Please install all removable media if selecting option 3.
  4  Quit
Enter option or letter: (default = 4) 4
 Type 'diag' to run diagnostics again, if desired
Diag D:\>
```

Figure C.2.3.4-3 System Diagnosis Program Termination Window

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C.2.3.4.1 Boot sequence setting of BIOS

Check the Boot sequence setting contents of BIOS.

(1) Terminate the node.
If the power indicator of the node lights up, press the power button a little longer and terminate the node.

(2) Refer to "Installation '2.1.1 Procedure for turning on the power' (INST 02-0000)", and turn on the power of the node.

(3) Confirm the setting of BIOS. Proceed to step (4).

(4) If "F2 = System Setup" is displayed on the upper right of the console window while rebooting the OS of the node, press [F2] key.
If you were unable to press [F2] key, press [Ctrl]+[Alt]+[Delete] keys and reboot the node. Execute from step (4) again.

(5) The BIOS Setup Utility Windows is displayed as in Figure C.2.3.4.1-1.
Select "Boot Settings", and press [Enter] key.

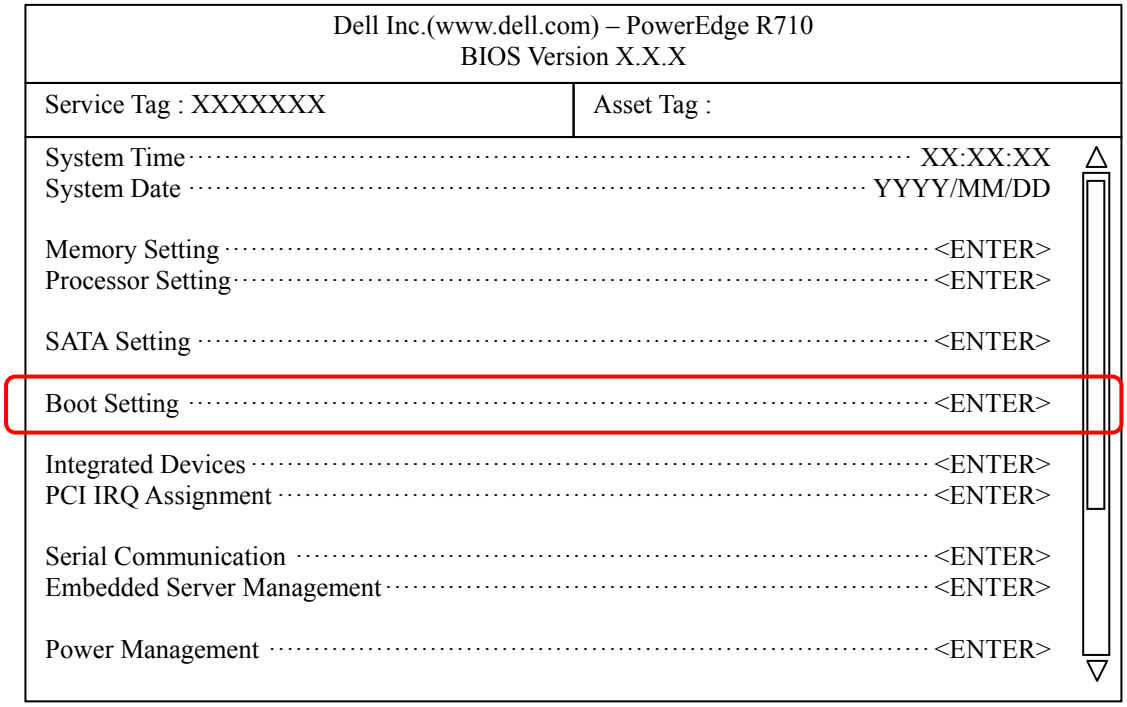

Figure C.2.3.4.1-1 BIOS Setup Utility Window

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(6) The Boot Settings Window is displayed as in Figure C.2.3.4.1-2.
Select “Boot Sequence”, and press [Enter] key.

```
Boot Mode ..................................................... BIOS
Boot Sequence ................................................ <ENTER>
Boot Sequence Retry ........................................... Disable
```

Figure C.2.3.4.1-2 Boot Settings Window

(7) The Boot Sequence Window is displayed as in Figure C.2.3.4.1-3.
Confirm that the displayed items are listed as in Figure C.2.3.4.1-3.
If the display order differs, use [+] and [-] key and sort it.
If the [√] sign is not on the far left of the displayed item, the device is disabled. Place the [√] sign by pressing [Space] key.

```
√1.SATA Optical drive
√2.Hard drive C:(Integrated RAID PERC 6/5 Integrate)
√3.Embedded NIC IMBA v5.0.5 Slot 0100
```

Figure C.2.3.4.1-3 Boot Sequence Window

(8) Press [Esc] key in the Boot Sequence Window as in Figure C.2.3.4.1-3.
It returns to the Boot Settings Window as in Figure C.2.3.4.1-4.

(9) Press [Esc] key in the Boot Settings Window as in Figure C.2.3.4.1-4.
It returns to the BIOS Setup Utility Window as in Figure C.2.3.4.1-5.

```
Dell Inc.(www.dell.com) – PowerEdge R710
BIOS Version X.X.X

Service Tag : XXXXXXX        Asset Tag :

System Time ................................ XX:XX:XX
System Date ................................ YYYY/MM/DD

Memory Setting ............................ <ENTER>
Processor Setting ......................... <ENTER>

SATA Setting .............................. <ENTER>

Boot Setting .............................. <ENTER>

Integrated Devices ........................ <ENTER>
PCI IRQ Assignment ........................ <ENTER>

Serial Communication ...................... <ENTER>
Embedded Server Management ................ <ENTER>

Power Management .......................... <ENTER>
```

Figure C.2.3.4.1-4 BIOS Setup Utility Window

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(10) Press [Esc] key in the BIOS Setup Utility Window as in Figure C.2.3.4.1-5.
The BIOS Setup Utility Termination Confirmation Window is displayed as in Figure C.2.3.4.1-6.

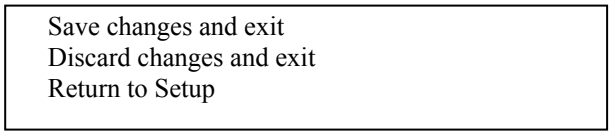

Figure C.2.3.4.1-5 BIOS Setup Utility Termination Confirmation Window

(11) The procedure differs depending on whether the setting was changed in step (7) or not.
(a) If the setting was changed in step (7), select "Save changes and exit" and press [Enter] key.

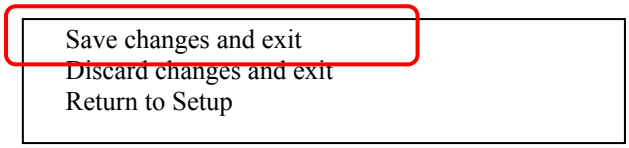

Figure C.2.3.4.1-6 BIOS Setup Utility Termination Confirmation Window (a)

(b) If the setting was not changed in step (7), select "Discard changes and exit" and press [Enter] key.

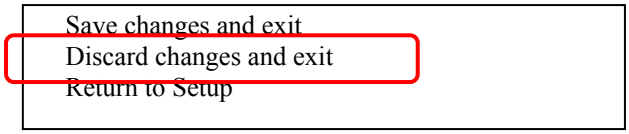

Figure C.2.3.4.1-7 BIOS Setup Utility Termination Confirmation Window (b)

(12) After a while, the Dell Start Window is displayed.

NOTE: If the Dell Start Window is not displayed even after a while and "No boot device available" is displayed, the Boot sequence setting of BIOS may be incorrect. Press [Ctrl] + [Alt] + [Delete] keys to reboot the node, and execute the step from (4) to review the setting of BIOS.

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C.2.3.5 Determination of node failure in the single node configuration

The following explains the failure determination and the failure part in the single node configuration.

Table C.2.3.5-1 Table of Determination matrix of the node operating status

Ping for the BMC port (*1)	OS starts up confirmation (*2)	ssh login for the maintenance port (*3)	Result of the determination
Y	Y	Y	node in operation
		N	node in operation (Maintenance port failure)
	N	—	node down
N	—	Y	node in operation (BMC failure)
		N	Ask the system administrator if the data can be accessed.

*1: Connect directly the BMC port to the maintenance PC with a LAN cable, and execute ping command for the BMC port.

*2: Check if the OS starts from the virtual console of BMC. For the details, refer to "Set Up '1.4 Connection Confirmation of the Remote Console' (SETUP 01-0010)".

*3: Connect directly the maintenance port to the maintenance PC with a LAN cable, and check if the ssh login can be done. For the details, refer to "Maintenance Tool '1.3 Procedures for Operating Commands' (MNTT 01-0200)".

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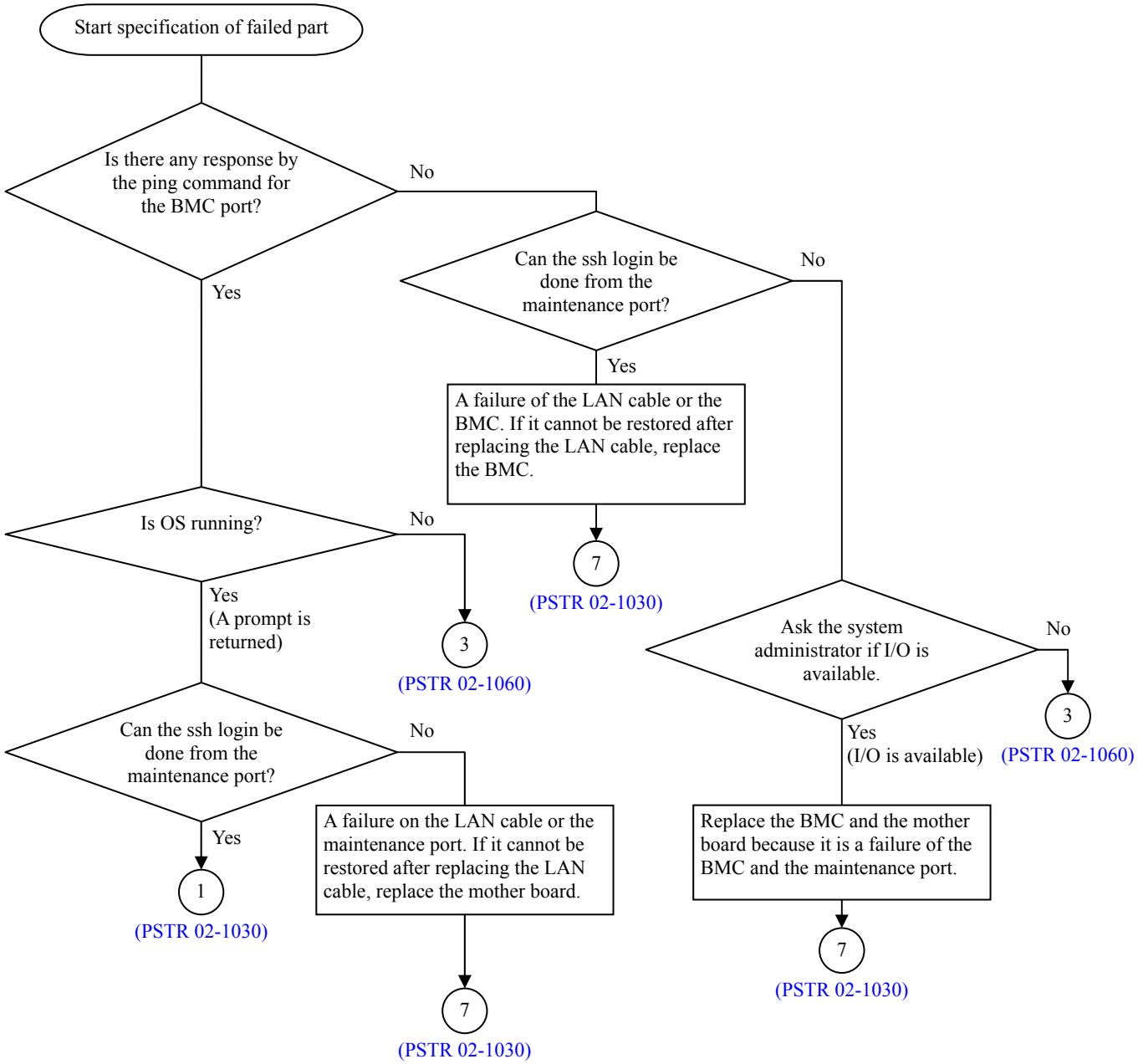

Figure C.2.3.5-1 Determining the node failure in the single node configuration (1/8)

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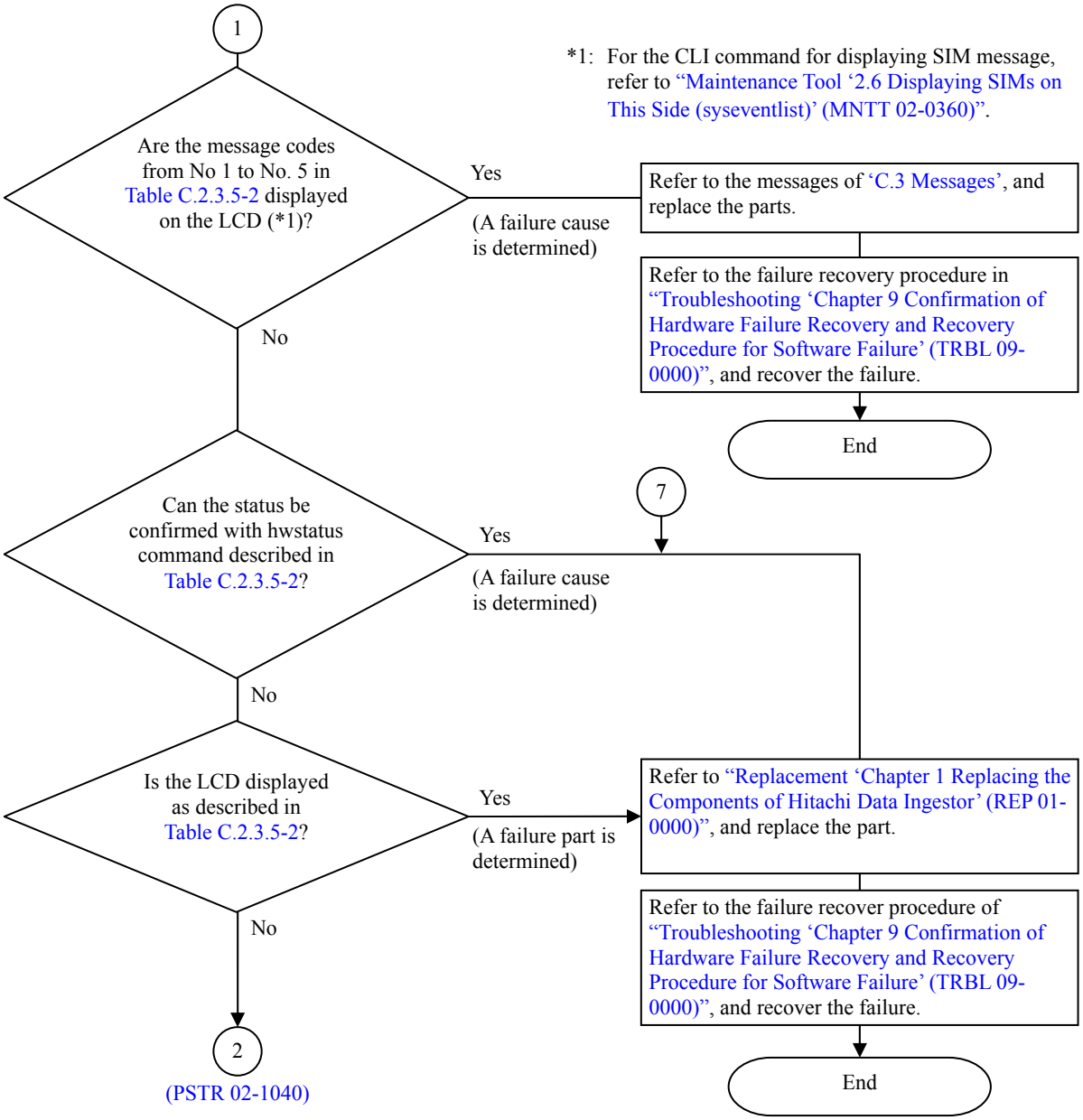

Figure C.2.3.5-1 Determining the node failure in the single node configuration (2/8)

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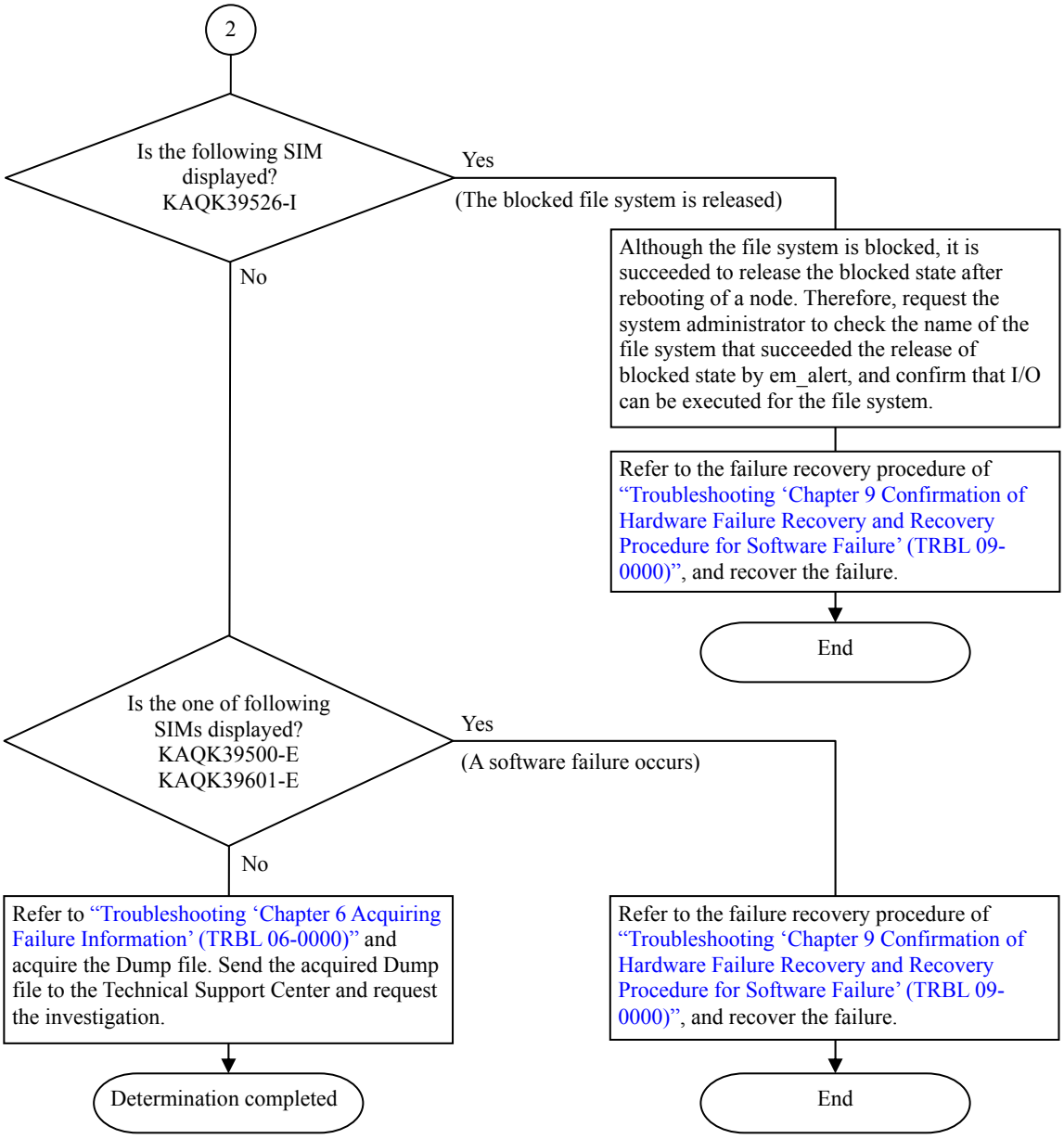

Figure C.2.3.5-1 Determining the node failure in the single node configuration (3/8)

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Table C.2.3.5-2 Failed parts shown by SIM or LCD

#	SIM	Display of LCD status or message code (*1)	LED status	Checking the status by the hwstatus command (*2)	Failed part
1	KAQG81003-W	—	—	Is the port status “Link down”?	On-board port, Extension NIC port, or cables (*3)
2	KAQK31500-E	E1610 E1614 E1618 E161C E1620 E1624 E1626 E1629	—	Is the PSU status “failed”?	One PSU
3	KAQK32500-E	E1310 E1311 E1313	—	Is the FAN status “failed”?	One FAN
4	KAQK37506-E	E1810	The LED indication on the embedded HDD blinks in yellow four times in one second.	Is the embedded HDD status “failed”?	One or Two units of Embedded HDD
5	KAQK36504-W	—	—	Is the port that displayed on the SIM message “Link down”?	—
6	KAQK37518-E	—	—	—	One or Two units of Embedded HDD
7	—	E1211 E1228	—	Is the battery status “failed”?	Embedded battery
8	—	—	—	Is the status of BMC “Unknown!”.	BMC

*1: If the LCD displayed in amber light, refer to the manual provided by the hardware vendor: “Dell™ PowerEdge™ R710 Systems Hardware Owner’s Manual” when the PowerEdge R710 is used, and check the message code starting from the letter “E” as shown in the above table.
If the current using model is unknown, check the product name by the label attached on the device.

*2: For the hwstatus command, refer to ‘B.3.1 Displaying the Hardware Status (hwstatus)’.

*3: When it is not recovered even if the cable is replaced, it is a port failure.

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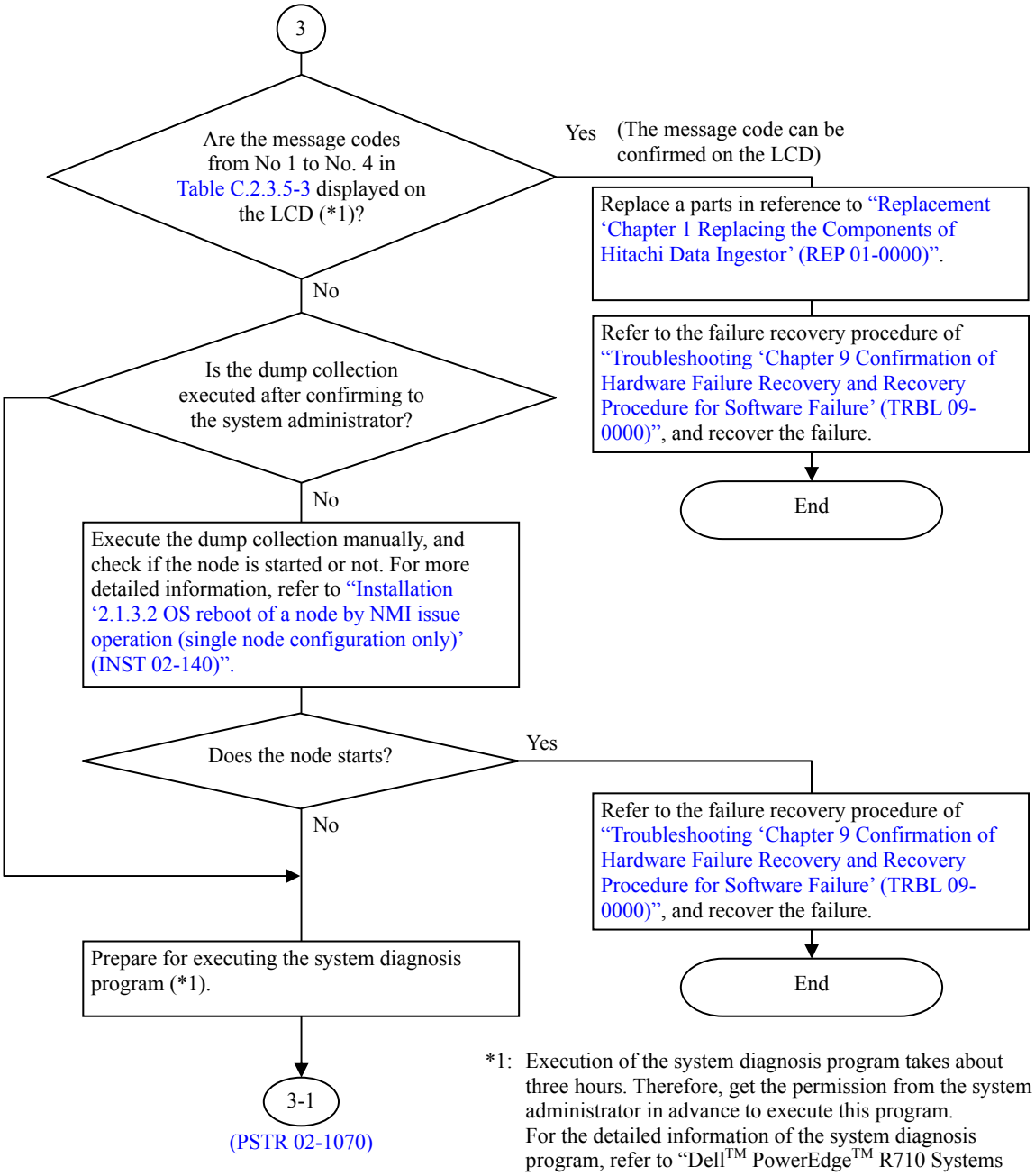

*1: Execution of the system diagnosis program takes about three hours. Therefore, get the permission from the system administrator in advance to execute this program.
For the detailed information of the system diagnosis program, refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" provided by the hardware vendor.

Figure C.2.3.5-1 Determining the node failure in the single node configuration (4/8)

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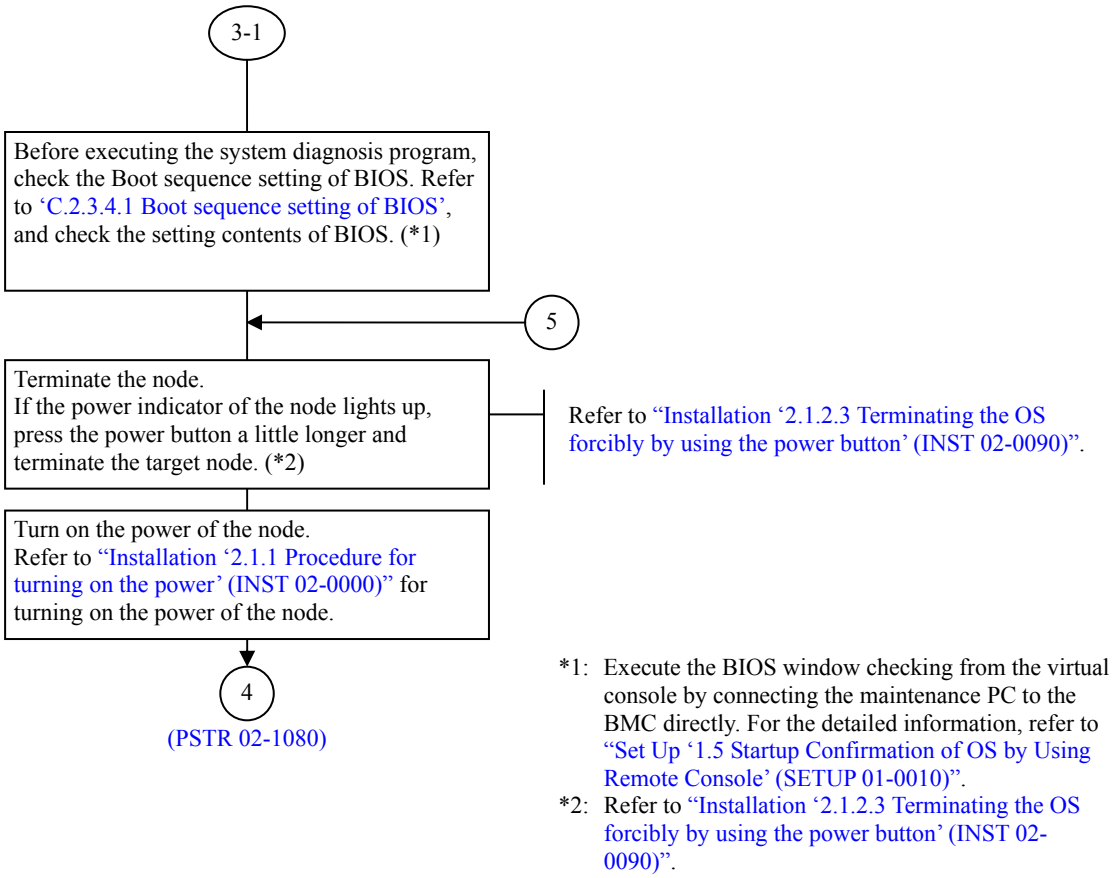

Figure C.2.3.5-1 Determining the node failure in the single node configuration (5/8)

Table C.2.3.5-3 Failed Parts by LCD

#	Display of message codes		Failed parts
1	E122D E2010 E2011 E2012 E2013 E201E	E2021 E2023 E2110 E2111 E2113	Memory
2	E1229 E122A E122C E1414 E1418 E141C E141F	E1420 E1422 E1717 E2020	CPU (Motherboard)
3	E1210		Motherboard
4	E1114 E1116		Abnormal temperature

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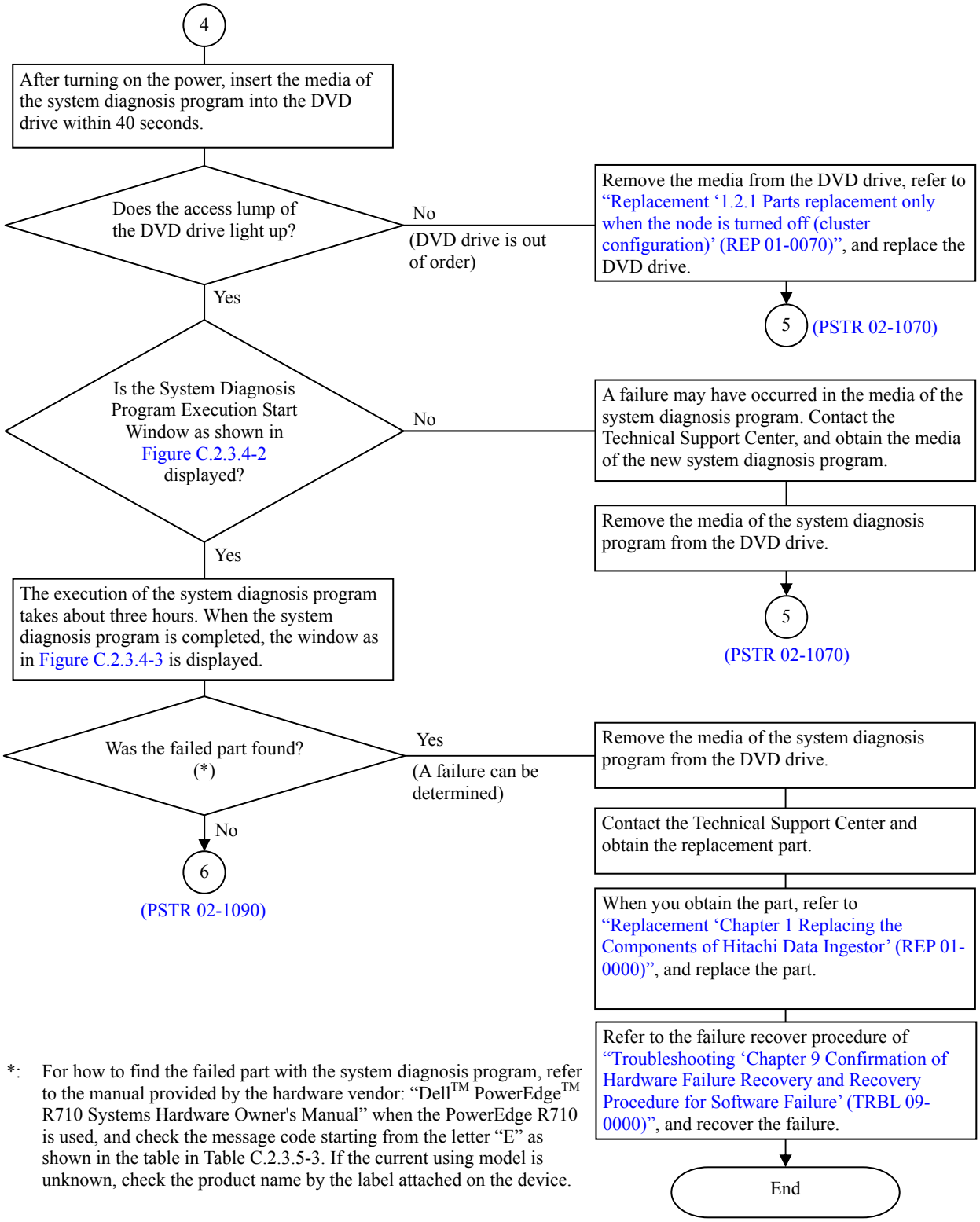

*: For how to find the failed part with the system diagnosis program, refer to the manual provided by the hardware vendor: "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" when the PowerEdge R710 is used, and check the message code starting from the letter "E" as shown in the table in Table C.2.3.5-3. If the current using model is unknown, check the product name by the label attached on the device.

Figure C.2.3.5-1 Determining the node failure in the single node configuration (6/8)

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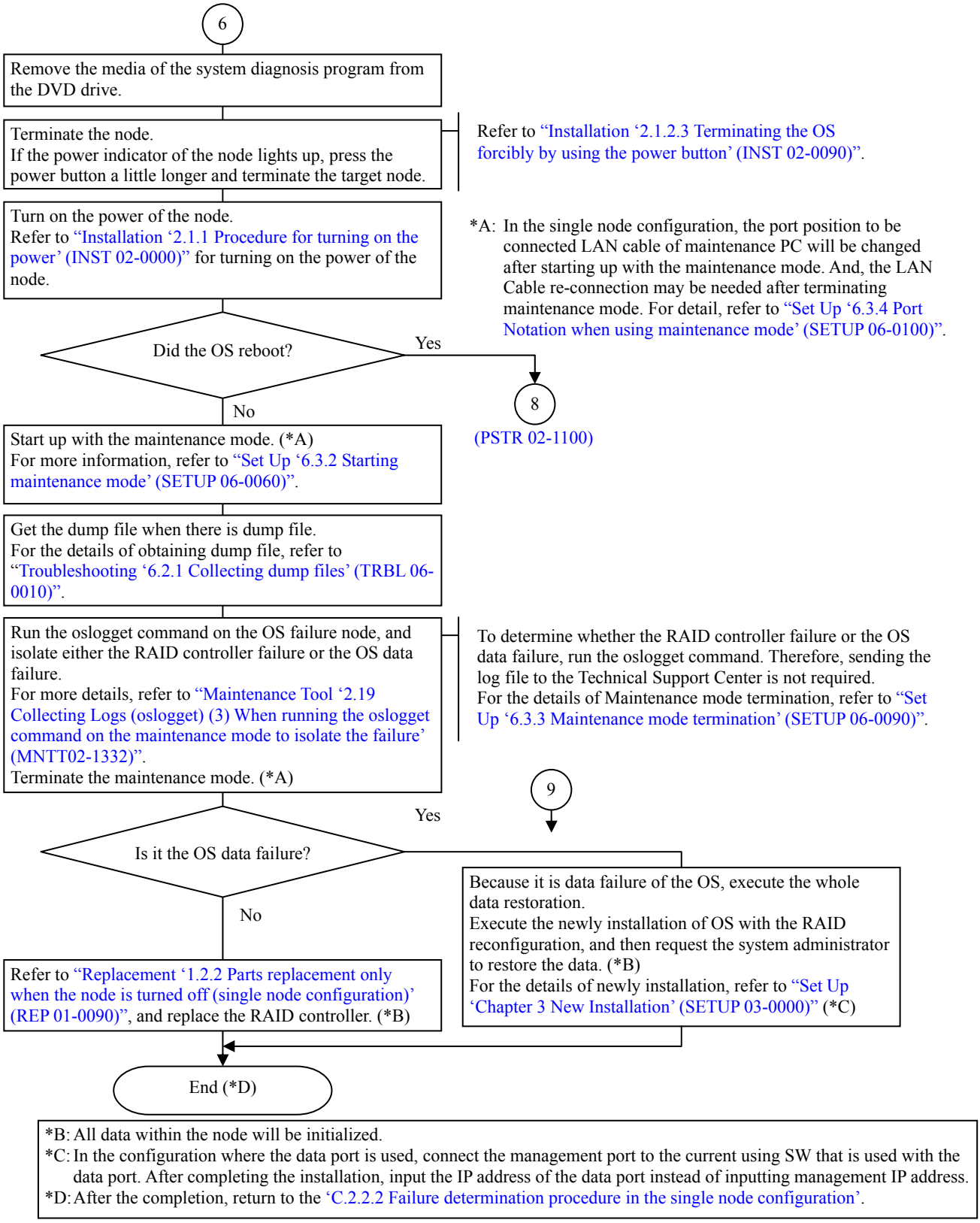

Figure C.2.3.5-1 Determining the node failure in the single node configuration (7/8)

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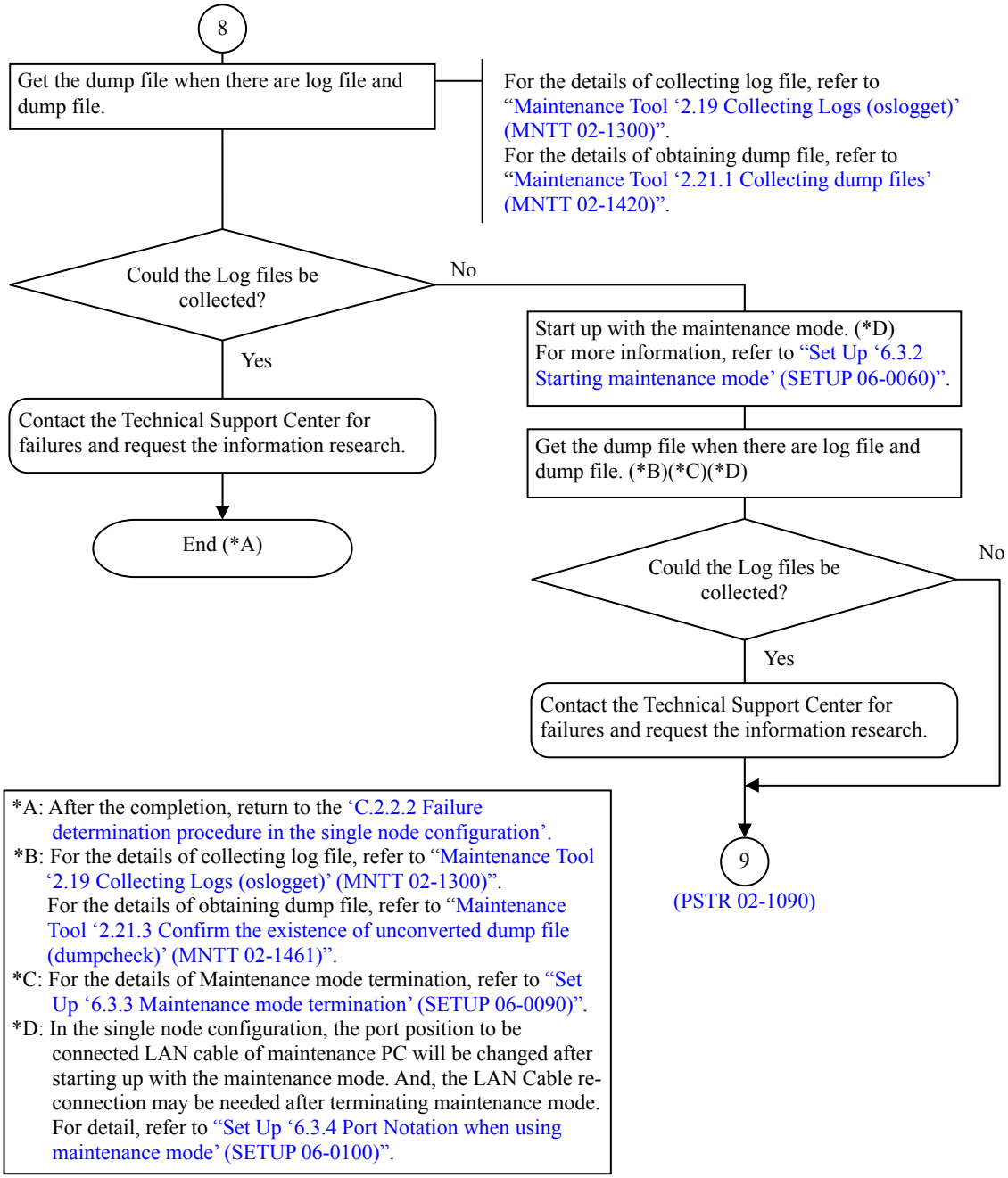

Figure C.2.3.5-1 Determining the node failure in the single node configuration (8/8)

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C.2.4 Diagnosis for OS Boot Failure

This section describes how to diagnose when the replaced part failure or other failure cause the OS boot failure after parts replacement operation.

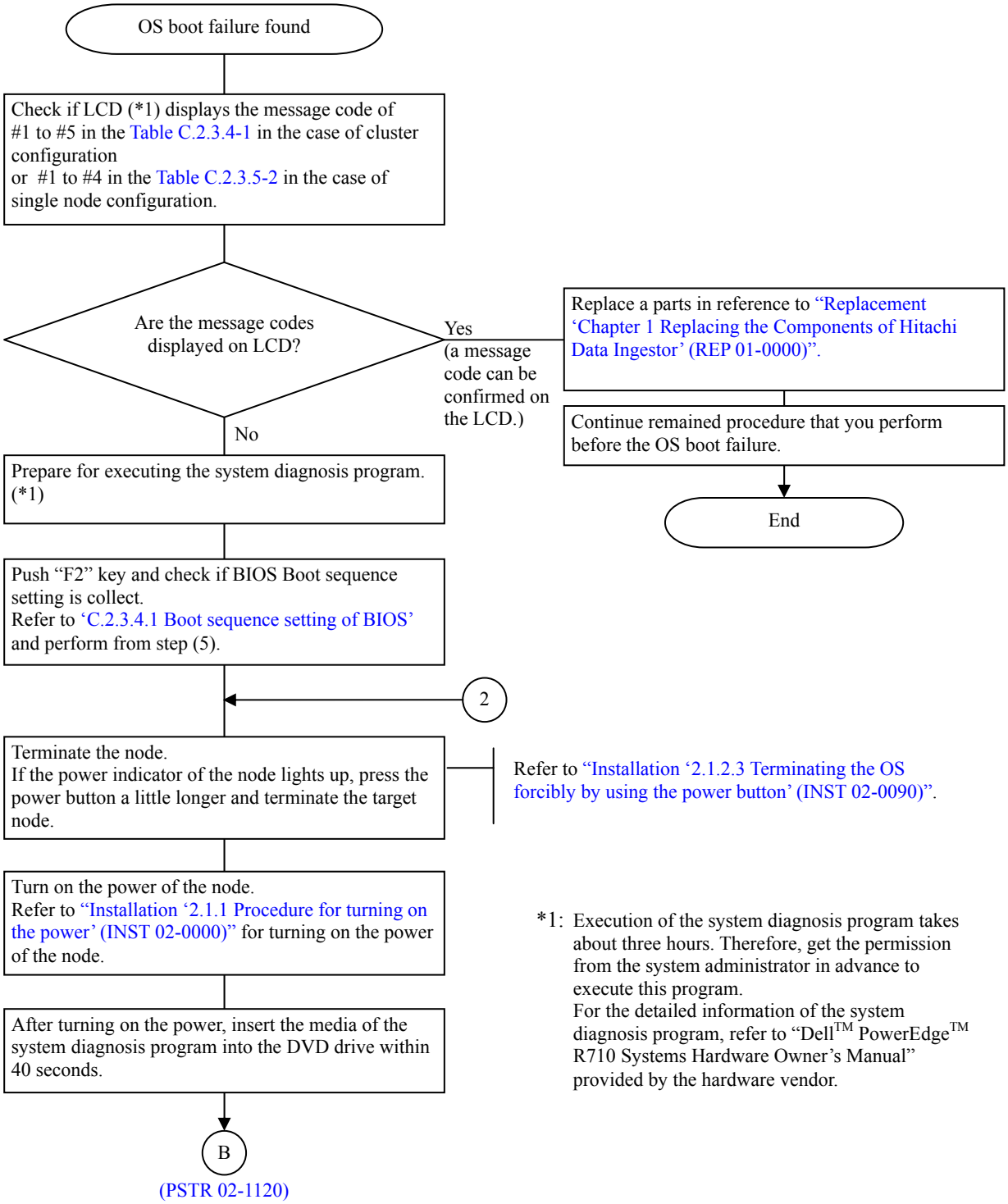

Figure C.2.4-1 Flow of Diagnosis for OS boot failure (1/4)

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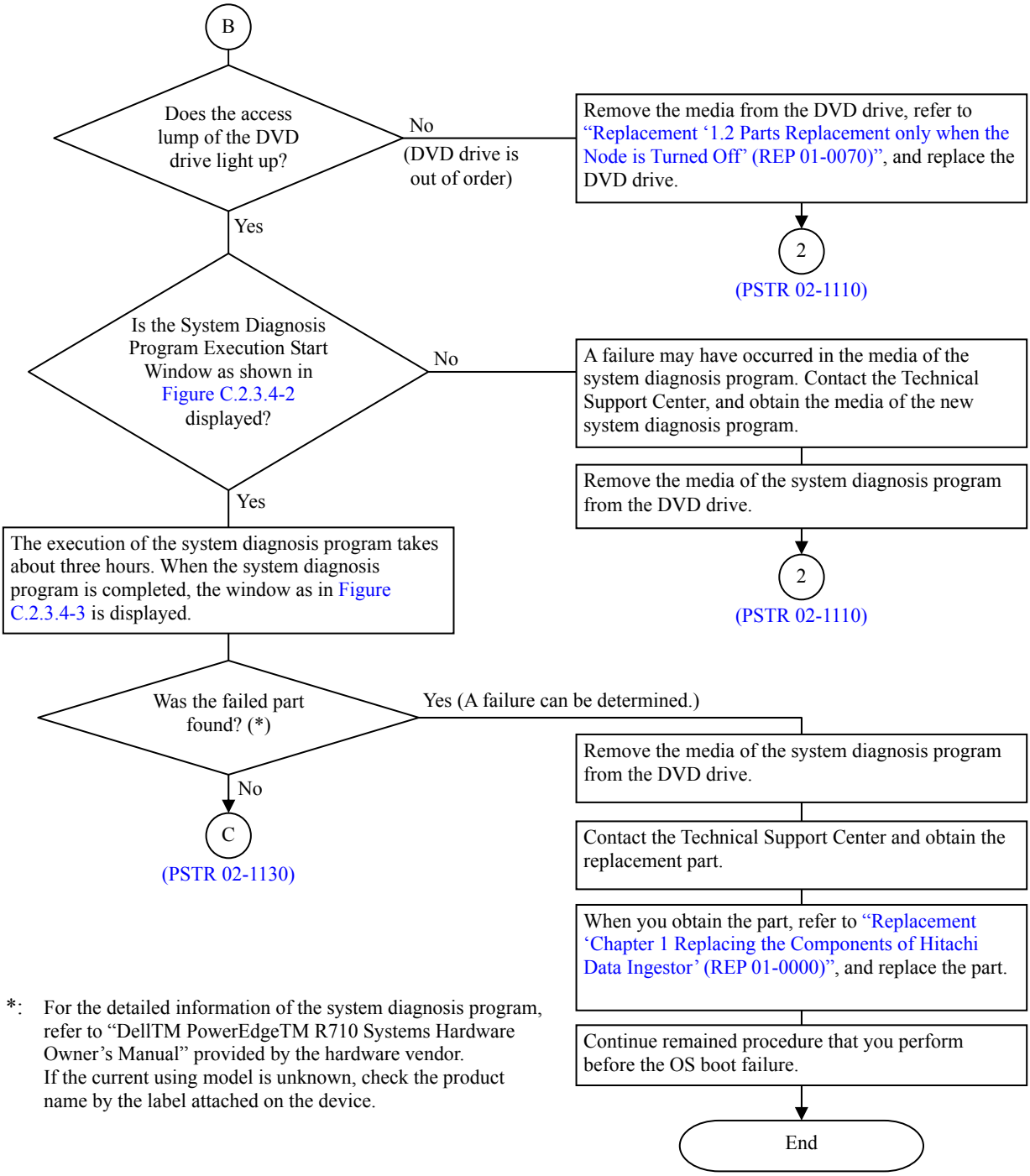

*: For the detailed information of the system diagnosis program, refer to "DellTM PowerEdgeTM R710 Systems Hardware Owner's Manual" provided by the hardware vendor.
If the current using model is unknown, check the product name by the label attached on the device.

Figure C.2.4-1 Flow of Diagnosis for OS boot failure (2/4)

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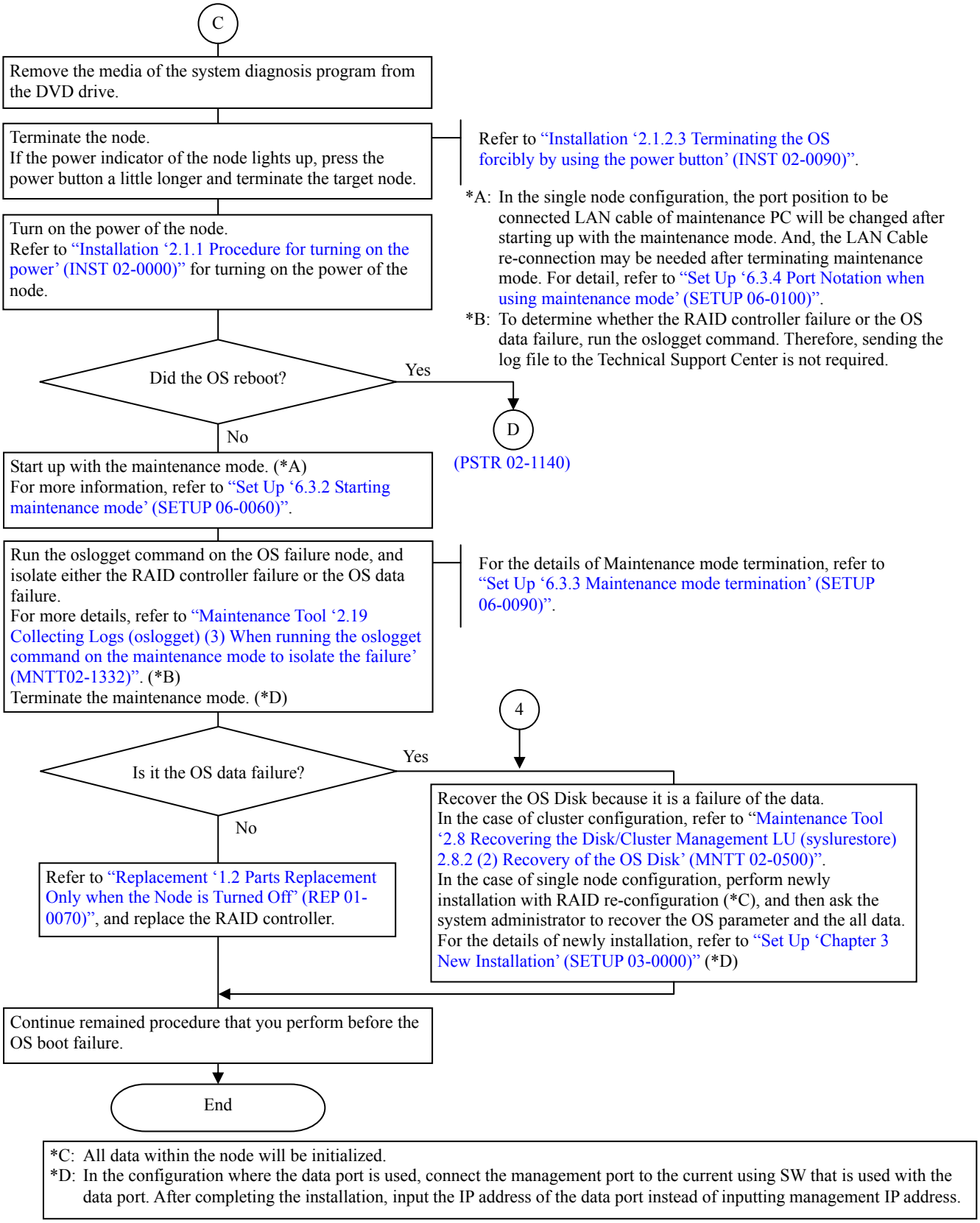

Figure C.2.4-1 Flow of Diagnosis for OS boot failure (3/4)

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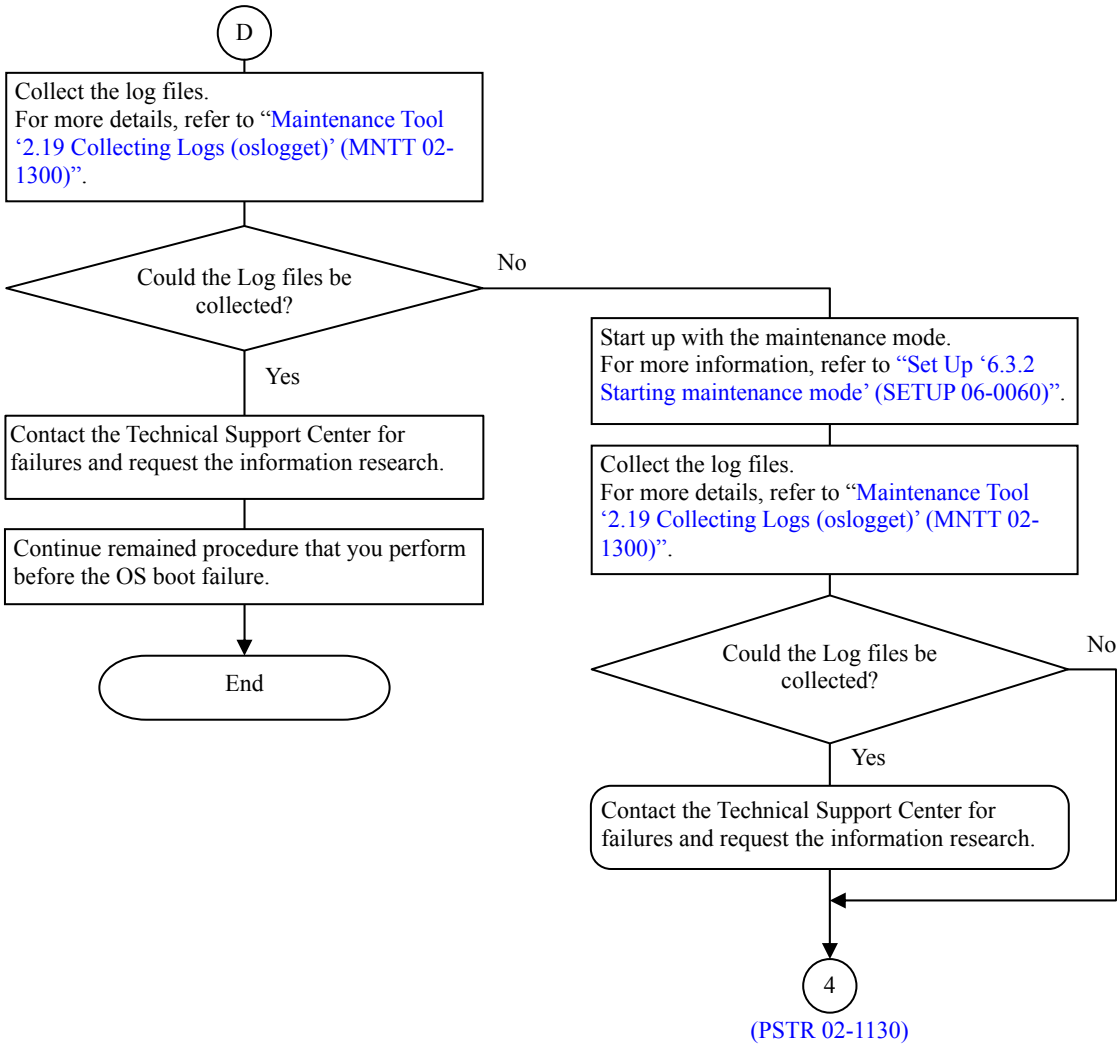

Figure C.2.4-1 Flow of Diagnosis for OS boot failure (4/4)

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C.3 Messages

This chapter describes messages.

C.3.1 SIM Messages

SIM messages detected by HDI and the recovery methods are described below.

Table C.3.1-1 Message IDs (70000s)

Message ID	Message text	Description	Recovery method	Reference Page
KAQG70000-E	Failover started, Node-<*node-number*>	This message reports that a failover started at <*#node*>.	—	—
KAQG70001-E	Failover ended, Node-<*node-number*>	This message reports that a failover was completed at <*#node*>.	—	—
KAQG72001-E	Failover ended(Move failed),Node-<*node-number*>	This message reports that a failover failed.	Perform the recovery procedure according to "Troubleshooting Chapter 1 Method of Local Initial Motion according to Maintenance Request".	"Troubleshooting 'Chapter 1 Method of Local Initial Measures According to Maintenance Request' (TRBL 01-0000)"
KAQG72011-E	Synchronization of the cluster information might become invalid.	This message reports that a failure occurred in the internal database of the cluster.	Perform the recovery procedure according to "Troubleshooting Chapter 1 Method of Local Initial Motion according to Maintenance Request".	"Troubleshooting 'Chapter 1 Method of Local Initial Measures According to Maintenance Request' (TRBL 01-0000)"

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Message ID	Message text	Description	Recovery method		Reference Page
KAQG72012-W	Communication via the main heartbeat cable was interrupted.	A failure occurred in the main heartbeat cable.	①	Check if the KAQG72013-W message was reported before or after the KAQG72012-W message. • If it was reported, two heartbeat cables are disconnected (Link down). Proceed to step⑥. • If it was not reported, proceed to step②.	—
			②	Check if the heartbeat LAN cable, which is directory connecting between nodes, reported with this message is fully inserted or not. If it is not, insert it correctly. Execute the hwstatus command from the maintenance PC to confirm that the heartbeat cable is connected. • If the link-up is confirmed, refer to "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure". Check if all the ports of the relevant node are in the normal status. • If the link-down port is confirmed, proceed to step③	'B.3.1 Displaying the Hardware Status (hwstatus)' "Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
			③	Replace the main heartbeat cable. After the replacement, execute the hwstatus command from the maintenance PC to confirm that the hb0 of Network Interface is in the state of up. • If it is confirmed that the cable is connected, refer to "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure". Confirm that all ports of the relevant node are in the normal status. • If it cannot be confirmed, proceed to step④.	'B.3.1 Displaying the Hardware Status (hwstatus)' "Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
			④	Directly insert the LAN cable from the maintenance PC to each link-down port and check if the port becomes link-up (i.e., the LED lights up). For details about how to confirm link-up with LEDs, refer to "Dell™PowerEdge™R710 Systems Hardware Owner's Manual". • If all ports have recovered through the above procedure, refer to "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure". Confirm that all ports of the relevant node are in the normal status. • If the link is still down after the above procedure, it is a port failure. It is necessary to replace NIC. Proceed to step⑤.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)" "Dell™PowerEdge™ R710 Systems Hardware Owner's Manual"

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Message ID	Message text	Description	Recovery method		Reference Page
(Continued) KAQG72012-W	Communication via the main heartbeat cable was interrupted.	A failure occurred in the main heartbeat cable.	⑤	Replace the Motherboard. After replacement, refer to "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and follow the recovery procedure.	"Replacement '1.2 Parts Replacement Only when the Node is Turned Off' (REP 01-0070)" "Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
			⑥	Check if the failover completion message (KAQK70001-E) was reported within 60 seconds before or after this message. • If it is confirmed, refer to 'C.2.3.4 Determination of node failures when a failover occurred' and perform the recovery procedure. • If it is not confirmed, refer to 'C.2.3.2 Determination of management network failure' and perform the recovery procedure.	'C.2.3.4 Determining the node failure when failover occurred' 'C.2.3.2 Determination of management network failure'
KAQG72013-W	Communication via the sub heartbeat cable was interrupted.	A failure occurred in the sub heartbeat cable.	①	Check if the KAQG72012-W message was reported before or after the KAQG72013-W message. • If it was reported, two heartbeat cables are disconnected (Link down). Follow the procedure of 'Message IDs (KAQG72012-W)'. (The execution of the procedure step⑥ in the KAQG72012-W) • If it was not reported, proceed to step②.	Message IDs (KAQG72012-W)
			②	A failure occurred on the way of connecting maintenance LAN port of the node. Follow the procedure of 'C.2.2 Determination Procedure when a Failure Occurred'.	'C.2.2 Determination Procedure when a Failure Occurred'
KAQG72014-I	Communication via the main heartbeat cable was restored.	The main heartbeat cable has recovered.	—		—
KAQG72015-I	Communication via the sub heartbeat cable was restored.	The sub heartbeat cable has recovered.	—		—

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Message ID	Message text	Description	Recovery method	Reference Page
KAQG72026-E	The resource group on the other node will be forcibly failed over to clear the DISABLE state of the cluster.	Automatic forced failover occurred.	A failure occurs on the power source or on the heartbeat channel and the reset channel connecting the both nodes. Go to 'C.2.2 Determination Procedure when a Failure Occurred', and then execute the troubleshooting.	'C.2.2 Determination Procedure when a Failure Occurred'
KAQG72027-E	The OS will restart to clear the DISABLE state of the cluster.	Automatic forced failover occurred on the other side node.	① Check if the KAQG72026-E message was reported for the other side node at the same period of time. •If it is reported, a failure has been occurred on the routes of heartbeat and reset that are connecting both nodes. Refer to 'Message IDs (KAQG72026-E)'. •If it was not reported, or the other side node is stopped, proceed to step②.	Message IDs (KAQG72026-E)
			② It might be interrupted the process of forced failover due to another failure. Refer to "Troubleshooting Chapter 6 Acquiring Failure Information", and get the troubleshooting information. After that, contact to the technical support center.	"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"
KAQG72028-W	The forced failover state will be cleared because the problem on the other node has been resolved.	The state of automatic forced failover is recovered.	—	—
KAQG72029-E	To clear the forced failover state, an attempt was made to restart the OS of the other node, but the attempt failed.	Resetting of the other side node failed at the time of recovering the state of forced failover.	The heartbeat channel that connected both nodes of a cluster where was in the state of automatic forced failover is recovered, but the reset process for the other side node has failed because there was still a failure on the reset channel. Go to 'C.2.2 Determination Procedure when a Failure Occurred', and then execute the troubleshooting.	'C.2.2 Determination Procedure when a Failure Occurred'
KAQG72030-E	To clear the forced failover state, an attempt was made to release access protection on one more LUs, but the attempt failed.	Releasing of the LU access protection failed at the time of recovering the state of forced failover.	The heartbeat channel that connected both nodes of a cluster in the state of automatic forced failover is recovered, but the release of LU access protection has failed. Refer to "Troubleshooting 5.3 Measures when Releasing the LU Access Protection Failed", and execute the recovery procedure.	"Troubleshooting '5.3 Measures when Releasing the LU Access Protection Failed' (TRBL 05-0530)"

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Table C.3.1-2 Message IDs (80000s)

Message ID	Message text	Description	Recovery method		Reference Page
KAQG81003-W	Trunking driver: One or more subdevices are down. *<master-device-name>:<subdevice-name>,<subdevice-name>…*	Links of the reported driver are combined (i.e. the number of links increases or decreases).	①	In the cluster configuration, check if the KAQK39504-E message was reported for a different node from the failed one within 60 seconds before or after this message. In the single node configuration, proceed to step②. • If it is confirmed, follow the procedure of the KAQK39504-E message in "Troubleshooting Chapter 8 Messages" to perform maintenance. • If it is not confirmed, proceed to step②.	'Message IDs (KAQK39504-E)'
			②	Reinsert the cable to the link-down port reported in this message. After all cables are reinserted into link-down ports, execute the hwstatus command again from the maintenance PC at the node where cables were reinserted. Confirm that the reinserted ports have become link-up (recovered). • If the port is still link-down (unrecovered) after reinserting the cable, proceed to step③. • If no link-down ports are detected (all ports are link-up), refer to "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure". Confirm that all ports of the corresponding node are in the normal status.	'B.3.1 Displaying the Hardware Status (hwstatus)' "Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
			③	Replace the cable of the link-down port reported in this message. After replacing all cables, execute the hwstatus command again at the node where the cables were replaced. Confirm that the port has become link-up (recovered). • If the port is still link-down (unrecovered) after replacing the cable, proceed to step④. • If no link-down ports are detected (all ports are link-up), refer to "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure". Confirm that all ports of the relevant node are in the normal status.	'B.3.1 Displaying the Hardware Status (hwstatus)' "Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"

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Message ID	Message text	Description	Recovery method		Reference Page
(Continued) KAQG81003-W	Trunking driver: One or more subdevices are down. <master-device-name>:<subdevice-name>,<subdevice-name>…	Links of the reported driver are combined (i.e. the number of links increases or decreases).	④	Directly insert the LAN cable from the maintenance PC to the link-down port reported in this message and check if the port becomes link-up (i.e., the LED lights up). For details about how to confirm link-up with LEDs, refer to "Dell™PowerEdge™R710 Systems Hardware Owner's Manual". • If the link is still down after the above procedure, it is a port failure. Proceed to step⑤. • If the relevant ports have a link-up through the above procedure, it seems the port failure on the user LAN switch. Request the system administrator to check and recover the relevant port. If all ports are link-up (recovered), refer to "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure". Confirm that the relevant node is in the normal status.	"Dell™PowerEdge™ R710 Systems Hardware Owner's Manual" "Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
			⑤	In the cluster configuration, replace the GbE-4Port card. In the single node configuration, replace the Motherboard. • If all ports are link-up (recovered), refer to Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure". Confirm that the relevant node is in the normal status.	"Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)'(REP 01-0070)" "Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)'(REP 01-0090)"
KAQG81004-I	Trunking driver: The subdevices that were down have been recovered. *<master-device-name>*: *<subdevice-name>*, *<subdevice-name>*…	Links of the reported driver are combined (i.e. down links have recovered).	—		—
KAQG81101-W	Trunking driver: The master device *<link-combined-device-name>* is down because all the sub-device were down.	Failures occurred in all ports of the combined links.	Check if the KAQG70001-E message was reported within 60 seconds before or after this message. • If it is confirmed, proceed to step② of Troubleshooting 'Message IDs (KAQG39504-E)'. • If it is not confirmed, proceed to step⑧ of 'Message IDs (KAQG39504-E)'.		'Message IDs (KAQG39504-E)'
KAQK81102-I	Trunking driver: The sub-devices that were down have recovered, and the master device *<link-combined-device>* has recovered.	All ports of the combined links have recovered.	—		—

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Table C.3.1-3 Message IDs (30000s)

Message ID	Message text	Description	Recovery method	Reference Page
KAQK30800-I	Migration terminated. (Policy name: <*policy-name*>, Task id: <*task-id*>, Task status: <*task-status*>, Lastexec start time: <*lastexec-start-time*>, Lastexec end time: <*lastexec-end-time*>, Succeeded files: <*succeeded-files*>, Target files: <*target-files*>, Failed files: <*failed-files*>, Post-command result: <*post-command-result*>)	The termination of the migration job occurred.	—	—
KAQK31500-E	PS failure detected(PS-Unit No)	A failure occurred in the power supply indicated with the unit number.	Replace the power supply of the indicated unit number. Refer to "Replacement 1.1 Replacing the Power Supply Unit/ AC Cable" and perform the procedure.	"Replacement '1.1 Replacing the Power Supply Unit/ AC Cable'(REP 01-0030)"
KAQK31501-I	PS failure recovered(PS-Unit No)	The power supply of the indicated unit number has recovered.	—	—
KAQK31502-I	PS added. (PS-Unit No)	A power supply unit was added during operation.	Request the system administrator to restore the power supply configuration to the original status.	—
KAQK31503-I	PS removed(PS-Unit No)	A power supply unit was removed during operation.	Request the system administrator to restore the power supply configuration to the original status.	—
KAQK32500-E	FAN failure detected(FAN- Unit No)	A failure occurred in the fan indicated with the unit number.	Replace the fan unit. Refer to "Replacement 1.2.1 Parts replacement only when the node is turned off (cluster configuration)" and perform the procedure.	"Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)'(REP 01-0070)"
KAQK32501-I	FAN failure recovered(FAN- Unit No)	The fan of the indicated unit number has recovered.	—	—
KAQK36504-W	NIC: Link down detected (<*interface-name*>)	NIC became link-down.	① Check if there are any messages IDs (KAQK39504-E) other than this message. • If any message is found, refer to 'Message IDs (KAQK39504-E)'. • If no message is found, proceed to step②.	'Message IDs (KAQK39504-E)'

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Message ID	Message text	Description	Recovery method		Reference Page
(Continued) KAQK36504-W	NIC: Link down detected (<*interface-name*>)	NIC became link-down.	②	Reinsert the cable to each link-down port reported in this message. After all cables are reinserted into link-down ports, execute the hwstatus command again from the maintenance PC for the node where cables are reinserted. Confirm that the reinserted ports are link-up (recovered). • If the port is still in the link-down (unrecovered) status after reinserting the cable, proceed to step③. • If no link-down ports are detected (all ports are link-up), refer to "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure". Check if all data ports of the relevant node are in the normal status.	'B.3.1 Displaying the Hardware Status (hwstatus)' "Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
			③	Replace the cables of each link-down port. After replacing all cables, execute the hwstatus command again for the node where the cables were replaced. Confirm that the port is link-up (recovered). • If the port is still in the link-down (unrecovered) status after replacing the cables, proceed to step④. • If no link-down ports are detected (all ports are link-up), refer to "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure". Check if all data ports of the relevant node are in the normal status.	'B.3.1 Displaying the Hardware Status (hwstatus)' "Replacement '1.5 Replacing the LAN Cable'(REP 01-0210)" "Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
			④	Directly insert the LAN cables from the maintenance PC to each link-down port and check if the port becomes link-up (i.e., the LED of the LAN port lights up on the node side). For details about how to confirm link-up with LEDs, refer to "Dell™PowerEdge™R710 Systems Hardware Owner's Manual". • If the link is still down after the above procedure, it is a port failure. In the cluster configuration, replace the NIC. In the single node configuration, replace the Motherboard. • If the relevant ports have a link-up through the above procedure, it seems the port failure on the user LAN switch. Request the system administrator to check and recover the relevant port. If all ports are link-up (recovered), refer to "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure". Confirm that the relevant node is in the normal status.	"Dell™PowerEdge™ R710 Systems Hardware Owner's Manual" "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)'(REP 01-0070)" "Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)'(REP 01-0090)" "Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"

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Message ID	Message text	Description	Recovery method	Reference Page
KAQK36700-E	An FC path error has occurred. (number of LUs for which errors occurred = *<number of LUs for which errors occurred>*)	FC path failure occurred. The number of LUs for which errors occurred is detected.	Follow the determination flowchart of 'C.2.2 Determination Procedure when a Failure Occurred" and identify the failure location on the FC path.	'C.2.2 Determination Procedure when a Failure Occurred'
KAQK36701-E	Errors have occurred on all the FC paths. (number of LUs for which errors occurred = *<number of LUs for which errors occurred>*)	Failures occurred in all paths to the LU. The number of LUs for which errors occurred is detected.	Check if the KAQK39527-E message was reported after this message. • If it is confirmed, refer to "Message IDs (KAQK39527-E)". • If it is not confirmed, Confirm that the KAQK36700-E message was reported before this message. Perform the same procedure as for 'Message IDs (KAQK36700-E)'.	'Message IDs (KAQK39527-E)' "Message IDs (KAQK36700-E)"
KAQK36703-E	An attempt to allocate memory failed.	Failed to allocate memory.	Check if the KAQK36705-E message was reported after this message. • If it is confirmed, refer to 'Message IDs (KAQK36705-E)'. • If it is not confirmed, follow the determination flowchart of 'C.2.2 Determination Procedure when a Failure Occurred' to identify the failure location on the FC path.	"Message IDs (KAQK36705-E)" 'C.2.2 Determination Procedure when a Failure Occurred'
KAQK36704-E	An attempt to attach the HDLM driver (the filter component) has failed. Number of failed paths = *<number>*	Unsupported storage is detected.	Request the system administrator to check the zoning setting of FC-SW.	—
KAQK36705-E	The system retried to allocate memory but the retries failed.	Memory allocation was attempted in succession but failed.	FC path failure. Follow the determination flowchart of 'C.2.2 Determination Procedure when a Failure Occurred' to identify the failure location on the FC path.	'C.2.2 Determination Procedure when a Failure Occurred'

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Message ID	Message text	Description	Recovery method		Reference Page
KAQK37503-E	CPU temperature warning detected[CPU No]	Abnormal temperature is detected.	①	Check the room temperature. (Room temperature: 10 to 40 degrees C is acceptable) Execute the hwstatus command from the maintenance PC to check if the fan operates normally. • If the fan status is abnormal, replace the fan. For details, refer to "Replacement 1.2.1 Parts replacement only when the node is turned off (cluster configuration)". After replacement, confirm that all fans operate normally. • If the fan status is normal, proceed to step②.	'B.3.1 Displaying the Hardware Status (hwstatus)' "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)'(REP 01-0070)"
			②	Acquire the failure information by referring to Troubleshooting "Chapter 6 Acquiring Failure Information".	"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"
KAQK37506-E	Internal disk drive failure detected(internal_disk_%d)	The internal HDD failed. (The relevant HDD number)	Refer to "Replacement 1.3 Replacing the Internal Hard Disk Drive" and replace the internal HDD.		"Replacement '1.3 Replacing the Internal Hard Disk Drive'(REP 01-0110)"
KAQK37507-I	Internal disk drive failure recovered(internal_disk_%d)	The internal HDD recovered from failure. (The relevant HDD number)	—		—
KAQK37508-W	BMC network communication failure detected	Communication is lost between the management port and the remote node's BMC port.	Refer to 'C.2.2 Determination Procedure when a Failure Occurred' to check if this is a management LAN failure.		'C.2.2 Determination Procedure when a Failure Occurred'
KAQK37509-I	BMC network communication failure recovered	Communication is reestablished between the management port and the remote node's BMC port.	—		—
KAQK37510-W	Management network communication failure detected	Communication is lost between the local management port and the remote node's management port.	Refer to 'C.2.2 Determination Procedure when a Failure Occurred' to check if this is a management LAN failure.		'C.2.2 Determination Procedure when a Failure Occurred'
KAQK37511-I	Management network communication failure recovered	Communication is reestablished between the local management port and the remote node's management port.	—		—
KAQK37516-I	Patrol Read detected information.(Details: time = %s, code = %s, content = %s, count = %s)	Some events about internal HDD were detected. (Number of count is displayed only when the multiple events occurred.)	—		—
KAQK37518-E	Patrol Read detected an error.(Details: time = %s, code = %s, content = %s, count = %s)	Critical Error might be occur at internal HDD. (Number of count is displayed only when the multiple errors occurred.)	The slot number of failed embedded HDD is displayed as "sX (X is positive integer)" in "content" of the message. Replace the embedded HDD connected to that slot number. For the replacement of the embedded HDD, refer to "Replacement 1.3 Replacing the Internal Hard Disk Drive".		"Replacement '1.3 Replacing the Internal Hard Disk Drive'(REP 01-0110)"

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Message ID	Message text	Description	Recovery method	Reference Page
KAQK37521-I	Communication temporarily went down between the management port and the BMC port on the other node.	The communication between the management port and the BMC port on the other side node lost temporarily.	Check if KAQK37508-W or KAQK37522-I exists after this SIM. If the message exists, follow the instruction described in that message. If the message does not exist, no measurement is required because the communication was lost temporarily but it recovers at present.	'Message IDs (KAQK37508-W)' Message IDs (KAQK37522-I)
KAQK37522-I	Intermittent failures have been detected <*X*> times between the management port and the BMC port on the other node.	The intermittent failures have been detected between the management port and the BMC port on the other side node. (X shows the number of times that broke the communication temporarily within an hour.)	Check if KAQK37508-W or KAQK37522-I exists after this SIM. If the message exists, follow the instruction described in that message. If the message does not exist, no measurement is required because the communication was lost temporarily but it recovers at present. However, If this message shows frequency, the cable might not be connected completely. Therefore, check the connection between the cable on the maintenance port and the cable of the BMC port on the other side node.	'Message IDs (KAQK37508-W)'
KAQK39500-E	OS error Detail= 00 00 00 01 ,Level =00 , Type=02	The file system necessary for booting is blocked or failed in mounting.	Follow the determination flowchart of 'C.2.2 Determination Procedure when a Failure Occurred'.	'C.2.2 Determination Procedure when a Failure Occurred'
	OS error Detail= 00 00 00 02 ,Level =00 , Type=02	A user file system is blocked.	Follow the determination flowchart of 'C.2.2 Determination Procedure when a Failure Occurred'.	'C.2.2 Determination Procedure when a Failure Occurred'
	OS error Detail= 00 00 00 03 ,Level =00 , Type=02	A cluster management LU file system is blocked.	Follow the determination flowchart of "Troubleshooting 9.1.3 Recovery Procedure for Software Failure".	"Troubleshooting '9.1.3 Recovery Procedure for Software Failure' (TRBL 09-0040)"
	OS error Detail= 00 00 03 00 ,Level =00 , Type=0D	A minor split brain occurred.	Refer to 'C.2.2 Determination Procedure when a Failure Occurred' to check if this is a management LAN failure.	'C.2.2 Determination Procedure when a Failure Occurred"
	OS error Detail= 00 00 03 01 ,Level =00 , Type=0D	A serious split brain occurred.	Perform "clstatus" on the node that have this SIM message, and check the cluster status.	"Maintenance Tool '2.2 Displaying the Cluster Status (clstatus)' (MNTT 02-0040)"
			If the cluster status is "Disable", refer to 'C.2.2 Determination Procedure when a Failure Occurred' to check if this is a management LAN failure. If the cluster status is not "Disable", this SIM message is temporary and does not indicate the failure.	'C.2.2 Determination Procedure when a Failure Occurred'
	OS error Detail= 00 00 04 00 ,Level =00 , Type=0D	The reset ping-pong prevention was operated.	Follow the determination flowchart of 'C.2.2 Determination Procedure when a Failure Occurred'.	'C.2.2 Determination Procedure when a Failure Occurred'

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Message ID	Message text	Description	Recovery method		Reference Page
(Continued) KAQK39500-E	OS error Detail= 00 01 00 02 ,Level =00 , Type=0A	The target file system to be stored is initialized before creating dump file.	Node is rebooted because of occurrence of an error, and an error is detected while collecting Dump. Collect the information of troubles, and report it to the Technical Support Center after executing troubleshooting with referring to the chapter of troubleshooting.		"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"
	OS error Detail= 00 02 00 02 ,Level =00 , Type=0A	Failed to mount the target file system to be stored at the time of dump collecting.	An error detected in the dump area while starting the node. Execute troubleshooting with referring to 'C.2.2 Determination Procedure when a Failure Occurred'.		'C.2.2 Determination Procedure when a Failure Occurred'
	OS error Detail= 05 00 00 00 ,Level =00 , Type=03	A panic failure occurred on the node that failed.	①	• If it is after nncreset command execution of the "Maintenance Tool 2.30 Resetting the OS of the Node (nncreset)" performed by the maintenance personnel, proceed to step②. •If it is not a result of the command that is executed by the maintenance personnel, proceed to step③.	"Maintenance Tool '2.30 Resetting the OS of the Node (nncreset)' (MNTT 02-1840)"
			②	It indicates that the nncreset command successfully completed and the dump can be obtained normally. Proceed to the next step such as the collecting dump.	—
			③	A panic failure occurred on the node that failed, and the dump can be obtained normally after the failure. Refer to 'C.2.3.4 Determining the node failure when failover occurred', and then execute the failure determination.	'C.2.3.4 Determining the node failure when failover occurred'
	OS error Detail= 05 00 00 01 ,Level =00 , Type=03	Memory image copying is completed successfully.	①	• If it is manual dump collection by the system administrator or the maintenance personnel (dump collection by the NMI button or the nncreset command of "Maintenance Tool 2.30 Resetting the OS of the Node (nncreset)", proceed to step②. • In other cases than the above, proceed to step③.	"Maintenance Tool '2.30 Resetting the OS of the Node (nncreset)' (MNTT 02-1840)"
			②	After a while, if "KAQK39528-I Processing to convert dump files ended." is displayed, as the dump file conversion is successful, execute the subsequent operation such as downloading dump. If the other SIM than the above is displayed after a while, the dump file creation failed. Collect the failure information, and contact the developer.	"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"
			③	A panic failure occurred on the failed node, and then the dump is acquired normally. Refer to 'C.2.3.4 Determining the node failure when failover occurred', and determine the failure.	'C.2.3.4 Determining the node failure when failover occurred'

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Message ID	Message text	Description	Recovery method	Reference Page
(Continued) KAQK39500-E	OS error Detail= 06 00 00 00 ,Level =00 , Type=03	Dump conversion timeout.	The node is rebooted due to a software failure. Collect the failure information and contact the developer.	"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"
	OS error Detail= 06 00 01 00 ,Level =00 , Type=03	Dump file conversion failed.	The node is rebooted due to a software failure. Collect the failure information and contact the developer.	"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"
	OS error Detail= 06 00 02 00 ,Level =00 , Type=03	Forced conversion of the dump file failed.	The node is rebooted due to a software failure. Collect the failure information and contact the developer.	"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"
	OS error Detail= 06 00 03 00 ,Level =00 , Type=03	Memory image copying failed.	The node is rebooted due to a software failure. Collect the failure information and contact the developer.	"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"
	OS error Detail= 06 01 01 00 ,Level =00 , Type=0A	Failed to register the function of dump file creation.	Failed to register the dump file creation function which is executed at the time of boot the node. Collect the failure information and contact the developer.	"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"
KAQK39501-E	Fatal failure detected. Shutting down.	An emergency shutdown occurred.	—	—
KAQK39502-I	OS is ready	This message is reported just before completion of the OS boot.	—	—
KAQK39503-I	OS is shutting down.	This message reports that shutdown of either system or both systems have started.	—	—

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Message ID	Message text	Description	Recovery method		Reference Page
KAQK39504-E	Link down in Front-end LAN	The data LAN or the maintenance LAN is link-down.	①	In the cluster configuration, check if the KAQG72013-W message was reported before or after this message. When it was reported, follow the instruction of the KAQG72013-W message. When it is not reported, proceed to step②. In the single node configuration, proceed to step③.	'Message IDs (KAQG72013-W)'
			②	Check if the failover message (KAQG70001-E) was reported at the other node within 60 seconds before or after this message was reported. • If it is confirmed, proceed to step③. • If it is not confirmed, proceed to step⑨.	—
			③	Check if the KAQG81101-W message was reported at the same node as this message within 60 seconds before or after this message was reported. • If it is confirmed, write down the master device name enclosed with < > in the KAQG81101-W message. Request the system administrator for the physical port information configuring the master device name. Request the system administrator and if all is recovered, proceed to step④. • If it is not confirmed, check that the KAQK36504-W message was reported within 60 seconds before or after this message. Write down the port number indicated in the message. Proceed to step④ • If the KAQK36504-W message is not also confirmed, refer to "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure". Check if all data ports of the relevant node are in the normal status.	'Message IDs (KAQG81101-W)' 'Message IDs (KAQK36504-W)' "Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
			④	Execute the hwstatus command for the service-stopped node from the maintenance PC. Confirm that the port written down in step step③ is actually link-down. Proceed to step⑤.	'B.3.1 Displaying the Hardware Status (hwstatus)'

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Message ID	Message text	Description	Recovery method		Reference Page
(Continued) KAQK39504-E	Link down in Front-end LAN	The data LAN or the maintenance LAN is link-down.	⑤	Reinsert the cable to each link-down port reported in this message. After all cables are reinserted into link-down ports, execute the hwstatus command again from the maintenance PC for the node where cables are reinserted. Confirm that the reinserted ports are link-up (recovered). • If the port is still link-down (unrecovered) after reinserting the cable, proceed to step⑥. • If no link-down ports are detected (all ports are link-up), refer to "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure". Check if all data ports of the relevant node are in the normal status.	'B.3.1 Displaying the Hardware Status (hwstatus)' "Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
			⑥	Replace the cable of each link-down port. After replacing all cables, execute the hwstatus command again for the node where the cables were replaced. Confirm that the port is link-up (recovered). • If the port is still link-down (unrecovered) after replacing the cable, proceed to step⑦. • If no link-down ports are detected (all ports are link-up), refer to "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure". Check if all data ports of the relevant node are in the normal status.	'B.3.1 Displaying the Hardware Status (hwstatus)' "Replacement '1.5 Replacing the LAN Cable'(REP 01-0200)" "Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"

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Message ID	Message text	Description	Recovery method		Reference Page
(Continued) KAQK39504-E	Link down in Front-end LAN	The data LAN or the maintenance LAN is link-down.	⑦	Directly insert the LAN cable from the maintenance PC to each link-down port and check if the port becomes link-up (i.e., the LED of the LAN port lights up on the node side). For details about how to confirm link-up with LEDs, refer to "Dell™PowerEdge™R710 Systems Hardware Owner's Manual". • If the link is still down after the above procedure, it is a port failure. In the cluster configuration, replace the NIC. In the single node configuration, replace the Motherboard. • If the relevant ports reached link-up through the above procedures, the port failure on the user LAN switch can be considered. Request the system administrator to check and recover the relevant port. If all ports are link-up (recovered), refer to "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure". Confirm that the relevant node is in the normal status.	"Dell™PowerEdge™ R710 Systems Hardware Owner's Manual" "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)'(REP 01-0070)" "Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)' (REP 01-0090)" "Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
			⑧	Perform the system diagnosis program and send notice to the support center. After replacement, refer to "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and perform the maintenance procedure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
			⑨	It might be a failure on the user LAN switch. Request the system administrator to check and recover the LAN switch.	—

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Message ID	Message text	Description	Recovery method	Reference Page
KAQK39505-E	OS error[cluster] Detail= 00 01 00 00	Mounting the cluster management LU failed (CLU_partition failure).	Refer to the failure recovery procedure of "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	OS error[cluster] Detail= 01 01 00 00	Un mounting the cluster management LU failed (CLU_partition failure).	Refer to the failure recovery procedure of "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	OS error[cluster] Detail= 00 02 00 00	Pre-processing of NFS failed.	Refer to the failure recovery procedure of "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	OS error[cluster] Detail= 01 02 00 00	Post-processing of NFS failed.	Refer to the failure recovery procedure of "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	OS error[cluster] Detail= 00 03 00 00	Mounting the file system failed.	Refer to the failure recovery procedure of "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	OS error[cluster] Detail= 01 03 00 00	Unmounting the file system failed.	Refer to the failure recovery procedure of "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"

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Message ID	Message text	Description	Recovery method		Reference Page
(Continued) KAQK39505-E	OS error[cluster] Detail= 00 04 00 00	Starting the NFS sharing failed.	Refer to the failure recovery procedure of “Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.		“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”
	OS error[cluster] Detail= 01 04 00 00	Stopping the NFS sharing failed.	Refer to the failure recovery procedure of “Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.		“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”
	OS error[cluster] Detail= 00 05 00 00	Bringing the virtual IP up failed.	①	Check if the KAQK39504-E message was reported within 60 seconds before or after this message. • If it is confirmed, proceed to step②. • If it is not confirmed, proceed to step③.	—
			②	Perform the maintenance procedure described in “Message IDs (KAQK39504-E)”.	‘Message IDs (KAQK39504-E)’
			③	Refer to the failure recovery procedure of “Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”
	OS error[cluster] Detail= 01 05 00 00	Bringing the virtual IP down failed.	①	Check if the KAQK39504-E message was reported within 60 seconds before or after this message. • If it is confirmed, proceed to step②. • If it is not confirmed, proceed to step③.	—
			②	Perform the maintenance procedure described in “Message IDs (KAQK39504-E)”.	‘Message IDs (KAQK39504-E)’
			③	Refer to the failure recovery procedure of “Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”

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Message ID	Message text	Description	Recovery method	Reference Page
(Continued) KAQK39505-E	OS error[cluster] Detail= 00 06 00 00	Starting the CIFS service failed.	Refer to the failure recovery procedure of "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	OS error[cluster] Detail= 01 06 00 00	Stopping the CIFS service failed.	Refer to the failure recovery procedure of "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	OS error[cluster] Detail= 00 08 00 00	Startup processing of the resource group failed.	Refer to the failure recovery procedure of "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	OS error[cluster] Detail= 01 08 00 00	Stop processing of the resource group failed.	Refer to the failure recovery procedure of "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	OS error[cluster] Detail= 00 0A 00 00	File snapshot or file version restore function failure (Startup processing of the resource group failed.)	Refer to the failure recovery procedure of "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	OS error[cluster] Detail= 01 0A 00 00	File snapshot or file version restore function failure (Stop processing of the resource group failed.)	Refer to the failure recovery procedure of "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"

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Message ID	Message text	Description	Recovery method	Reference Page
KAQK39506-I	A failure occurred. Please follow the proper recovery procedure. Detail=10 03 00 00	All file systems were blocked due to D-vol overflow (when the script was started).	Send the content of this message to the system administrator.	—
	A failure occurred. Please follow the proper recovery procedure. Detail=10 04 00 00	All NFSs were blocked due to D-vol overflow (when the script was started).	Send the content of this message to the system administrator.	—
KAQK39507-E	Reset to the other node in the cluster was requested (result:<*reset requested result*>, cause:<*reset cause*>, os status:<*OS status*>).	Resetting for the other side is issued.	If the content of the result is "failure", resetting the other side node is not successful. Determine the failure with 'C.2.2 Determination Procedure when a Failure Occurred'. If the content of the result is other than above, it is normal processing and not required any troubleshooting.	'C.2.2 Determination Procedure when a Failure Occurred'
KAQK39524-E	Peer os status could not be acquired.	Acquisition of status of the other side node failed.	① Check if the KAQK37508-W message was reported before or after reporting the KAQK39508-E message. • If it is reported, refer to "Message IDs (KAQK37508-W)". • If it is not reported, proceed to step②.	'Message IDs (KAQK37508-W)'
			② A failure is in the setting of BMC. Refer to "Installation 2.1.2 Procedures for turning off the power", and stop the other side node of the node where the message ID (KAQK39508-E) is reported. And then refer to 'B.2.5 BMC Setting Procedure', and check if there is a failure on the setting of BMC on the node that stopped.	"Installation '2.1.2 Procedures for turning off the power'(INST 02-0050)" 'B.2.5 BMC Setting Procedure'
KAQK39525-I	Peer os status could be acquired.	Recovered to the state to get the other side node status.	—	—
KAQK39526-I	The blockage of the file system (file-system-name) has been released.	The blockage of the file system (file-system name) has been released.	—	—
KAQK39527-E	A file system (file system name = <*file system name*>, device = <*device number*>) is blocked because there is no unused capacity in the Pool.	The user file system has been in blockage because of the DP pool exhaustion .	Ask system administrator to recover the DP pool exhaustion.	—
KAQK39528-I	Processing to convert dump files ended.	Dump file conversion ended normally.	—	—
KAQK39601-E	Single Node error Detail=00 00 00 10 Level=00 Type=04	Mounting of file system failed.	Refer to the failure recovery procedure of "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"

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Message ID	Message text	Description	Recovery method	Reference Page
(Continued) KAQK39601-E	Single Node error Detail=00 00 00 11 Level=00 Type=04	Dismounting of file system failed.	Refer to the failure recovery procedure of "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	Single Node error Detail=00 00 00 20 Level=00 Type=04	Starting the NFS sharing failed.	Refer to the failure recovery procedure of "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	Single Node error Detail=00 00 00 21 Level=00 Type=04	Terminating the NFS sharing failed.	Refer to the failure recovery procedure of "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	Single Node error Detail=00 00 00 40 Level=00 Type=04	Startup of the CIFS service failed.	Refer to the failure recovery procedure of "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	Single Node error Detail=00 00 00 41 Level=00 Type=04	Stopping of the CIFS service failed.	Refer to the failure recovery procedure of "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	Single Node error Detail=00 00 00 50 Level=00 Type=04	Startup of the File snapshot or File version restore function failed.	Refer to the failure recovery procedure of "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"

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Message ID	Message text	Description	Recovery method	Reference Page
(Continued) KAQK39601-E	Single Node error Detail=00 00 00 51 Level=00 Type=04	Stopping of the File snapshot or File version restore function failed.	Refer to the failure recovery procedure of "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	Single Node error Detail=00 00 00 F0 Level=00 Type=04	Startup of the resource on the single node failed.	Refer to the failure recovery procedure of "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	Single Node error Detail=00 00 00 F1 Level=00 Type=04	Stopping of the resource on the single node failed.	Refer to the failure recovery procedure of "Troubleshooting Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"

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C.3.2 LCD Display Message Code

Among the cases in message codes that are displayed in the LDC when the hardware detects an error, some codes that require the troubleshooting and its recovery methods are described below.

Table C.3.2-1 LCD Message Code (Partly)

Message code	Description	Recovery method	Reference Page
E1310 E1313	A failure occurred in the FAN.	(1) Check if multiple codes E1310/E1313 appear on the LCD. If multiple codes appear, proceed to (2). If it only one code appears, proceed to (3). (2) Replace the (multiple) failed FAN units. Refer to "Replacement 1.2.1 Parts replacement only when the node is turned off (cluster configuration)" and perform the procedure. (3) Replace the (one) failed FAN unit. Refer to "Replacement 1.2.1 Parts replacement only when the node is turned off (cluster configuration)" and perform the procedure. After completing the replacement, refer to "Troubleshooting Chapter 6 Acquiring Failure Information" and request the developer to analyze the problem.	"Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)'(REP 01-0070)" "Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"
E1114 E1116	Abnormal temperature is detected.	(1) After confirming the LCD display, check if the E1310 or E1313 appears on the LCD. If it is confirmed, it is FAN unit failure. Follow the section of the FAN unit failure. If it is not confirmed, proceed to (2). (2) Request the system administrator to take measurement on room temperature and dust in the air intake system. (3) Turn the power source indicator on. Check that the OS prompt window is displayed on the monitor. If this cannot be confirmed, refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" is used, and then take an appropriate procedure to recover the problem.	"Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual"
E1715	BIOS post failure is detected.	After confirming LCD display, refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" is used, and then take an appropriate procedure to recover the problem.	"Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual"

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C.3.3 KAQX Messages

This model does not support relations with HCP Anywhere.

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D.1 Replacing the Components

Table D.1-1 shows the parts to be replaced and the status of the power to the node in replacement. The parts name of the hardware vendor is also shown in the following table because when the parts are to be replaced, it must see "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" provided by the hardware vendor.

Table D.1-1 Parts to be Replaced and the Status of the Power to the Node in Replacement (1/2)

No.	Component	Dell/ PowerEdge R710 component name	Node configuration	Node power status and right or wrong of part exchange		Parts replacement	Approximate work time
				On *2	Off *3		
1	Power Supply unit/ AC Cable	Power Supplies/ AC Cable	Cluster configuration	Y (*1)	Y	'D.1.1.1 Replacing the Power Supply Unit/ AC Cable (cluster configuration)'	60 minutes
			Single node configuration	N	Y	'D.1.1.2 Replacing the Power Supply Unit/ AC Cable (single node configuration)'	
2	Fan unit	Cooling Fans	Cluster configuration	N	Y	'D.1.2.1 Replacing the Fan Unit (cluster configuration)"	60 minutes
			Single node configuration			'D.1.2.2 Replacing the Fan Unit (single node configuration)"	
3	Internal hard disk drive	Hard Drives	Cluster configuration	Y (*4)	Y	'D.1.3.1 Replacing the Internal Hard Disk Drive (cluster configuration)"	180 minutes
			Single node configuration	Y (*5)	N	'D.1.3.2 Replacing the Internal Hard Disk Drive (single node configuration)"	
4	RAID Controller	Integrated Storage Controller Card	Cluster configuration	N	Y	'D.1.4.1 Replacing the RAID Controller (cluster configuration)"	120 minutes
			Single node configuration			'D.1.4.2 Replacing the RAID Controller (single node configuration)"	
5	Memory	System Memory	Cluster configuration	N	Y	'D.1.5.1 Replacing the Memory (cluster configuration)"	60 minutes
			Single node configuration			'D.1.5.2 Replacing the Memory (single node configuration)"	
6	Fibre Channel Card (*3)	Expansion Cards	Cluster configuration	N	Y	'D.1.6.1 Replacing the Fibre Channel Card (cluster configuration)"	120 minutes
7	GbE-4Port Card (*3)	Expansion Cards	Cluster configuration	N	Y	'D.1.7.1 Replacing the GbE-4Port Card (cluster configuration)"	60 minutes

*1: Replacement while the power is on is possible only in case of failure in one node. (Replacement must be performed while the power is off in case of failure in both nodes.)
*2: The node is in operation.
*3: The failover is being performed for the other node, and the user service continues.
*4: Replacement while the power is on is possible only in case of failure in one node. Replacement must be performed while the power is off in case of failure in both nodes).
*5: Replacement while the power is on is possible both in case of failure in one node and in case of failure in both nodes.

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Table D.1-1 Parts to be Replaced and the Status of the Power to the Node in Replacement (2/2)

No.	Component	Dell/ PowerEdge R710 component name	Node configuration	Node power status and right or wrong of part exchange		Parts replacement	Approximate work time
				On *2	Off *3		
8	GbE-2Port Card (*3)	—	—	—	—	'D.1.8 Replacing the GbE-2Port Card'	—
9	Motherboard	System Board	Cluster configuration	N	Y	'D.1.9.1 Replacing the Motherboard (cluster configuration)'	90 minutes
			Single node configuration			'D.1.9.2 Replacing the Motherboard (single node configuration)'	
10	DVD Drive	Optical Drive	Cluster configuration	N	Y	'D.1.10.1 Replacing the DVD Drive (cluster configuration)'	60 minutes
			Single node configuration			'D.1.10.2 Replacing the DVD Drive (single node configuration)'	
11	CPU	—	—	—	—	'D.1.11 Replacing the CPU'	—
12	HDD Backplane board	—	—	—	—	'D.1.12 Replacing the HDD Backplane board'	—
13	Front Panel Board	—	—	—	—	'D.1.13 Replacing the Front Panel Board'	—
14	PS Backboard	—	—	—	—	'D.1.14 Replacing the PS Backboard'	—
15	Lithium Battery	—	—	—	—	'D.1.15 Replacing the Lithium Battery'	—
16	PCI Riser Board	—	—	—	—	'D.1.16 Replacing the PCI Riser Board'	—
17	CPU Heatsink	—	—	—	—	'D.1.17 Replacing the CPU Heatsink'	—
18	CPU Air Duct	—	—	—	—	'D.1.18 Replacing the CPU Air Duct'	—
19	Cable	—	—	—	—	'D.1.19 Replacing the Cable'	—
20	BMC	iDRAC6	Cluster configuration	N	Y	'D.1.20.1 Replacing the BMC (cluster configuration)'	90 minutes
			Single node configuration			'D.1.20.2 Replacing the BMC (single node configuration)'	
21	Management Port	—	—	—	—	'D.1.21 Replacing the Management Port'	—
22	Internal RAID Battery	—	—	—	—	'D.1.22 Replacing the Internal RAID Battery'	—
23	USB board	—	—	—	—	'D.1.23 Replacing the USB Board'	—
24	SFP module	—	—	—	—	'D.1.24 Replacing the SFP module'	—

*1: Replacement while the power is on is possible only in case of failure in one node. (Replacement must be performed while the power is off in case of failure in both nodes.)
*2: The node is in operation.
*3: The failover is being performed for the other node, and the user service continues.

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D.1.1 Replacing the Power Supply Unit/ AC Cable

For the cluster configuration, refer to "D.1.1.1 Replacing the Power Supply Unit/ AC Cable (cluster configuration)".
For the single node configuration, refer to 'D.1.1.2 Replacing the Power Supply Unit/ AC Cable (single node configuration)'.

D.1.1.1 Replacing the Power Supply Unit/ AC Cable (cluster configuration)

Select either method:

Table D.1.1.1-1 Replacing a power supply unit

Method	Node status at replacement	Replacement procedure
1	The node is running.	D.1.1.1 (1) Replacing a power supply unit while the node is running
2	The node is turned off.	D.1.1.1 (2) Replacing a power supply unit while the node is turned off

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(1) Replacing a power supply unit while the node is running

NOTE: When replacing AC cable, read the word of Power supply unit as AC cable.

(a) Check whether the SIM message (KAQK31500-E PS failure detected (power_supply_unit-number)) is displayed.
For details about how to check messages, refer to "Maintenance Tool '2.6 Displaying SIMs on This Side (syseventlist)' (MNTT 02-0360)".

(b) Refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" and replace the power supply unit.

NOTE: When you replace a power supply unit, follow the instructions in the Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual.

(c) After you replace the power supply unit, connect the power supply cable, and then check whether the LED on the power supply unit lights green. For details about the color of the LED on a power supply unit, refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual".

(d) Check the following:
Check whether the SIM message (KAQK31501-I PS failure recovered (power _supply _unit-number)) is displayed. For details about how to check messages, refer to "Maintenance Tool '2.6 Displaying SIMs on This Side (syseventlist)' (MNTT 02-0360)".

Check the hardware status. Check whether "ok" is displayed for both 0 and 1 of "Power Supply Information" on the screen.
For details about how to check the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.
When all the checks are satisfactory, the replacement work is completed.
If any of the above checks is unsatisfactory, follow the instructions in the Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual and perform maintenance.

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(2) Replacing a power supply unit while the node is turned off

NOTE: When replacing AC cable, read the word of Power supply unit as AC cable.

(a) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(b) Refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" and replace the power supply unit.

NOTE: When you replace a power supply unit, follow the instructions in the Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual.

(c) After replacing the power supply unit, reconnect the cables where they were if they are all removed at the replacing operation. Then check whether the LED on the power supply unit lights green, and then press the power button on the node.

NOTE: When there is an instruction to let the heartbeat cable and maintenance port cable removed during operation, do not connect heartbeat cable and the maintenance port cable and just connect the other cables.

(d) Refer to "Set Up '1.3 Startup Confirmation of the OS by Using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup is not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (e).
If the login prompt window is displayed, proceed to the step (e).

(e) Check whether the OS is completely started on the node. To check, execute the peerstatus command on the other (normal) node and check whether the status is [BOOT COMPLETE].
For details about how to check node status, refer to "Maintenance Tool '2.36 Displaying the Status of Other Side Node (peerstatus)' (MNTT 02-2130)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

(f) After the OS is started on the node, check the following:
Check the hardware status. Check whether "ok" is displayed for both 0 and 1 of "Power Supply Information" on the screen.
For details about how to check the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.

(g) Return to the step (f) of "Replacement '1.1.1 Replacing the Power Supply Unit/ AC cable (cluster configuration) (2) Replacing a power supply unit while the node is turned off (REP 01-0040)" and execute the rest of the procedures.

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D.1.1.2 Replacing the Power Supply Unit/ AC Cable (single node configuration)

NOTE: When replacing AC cable, read the word of Power supply unit as AC cable.

(1) Replacement procedure while the node is running
Dell™ PowerEdge™ R710 cannot execute replacement operation while the node is running.

(2) Replacement procedure while the node is turned off

(a) Stop the OS on the target node.
Before stopping the OS of the node, ask the system administrator if the service can be stopped or not. After that confirmation, execute the operation.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(b) Refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" and execute power supply unit replacement.

NOTE: When you replace a power supply unit, follow the instructions in the following "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" provided by the hardware vendors.

(c) After the power supply unit replacement is completed, in case the replacement operation was performed by removing all the cables, reconnect the cables where they were, confirm that the LED of the power supply unit lights green, and then turn on the power supply button.

(d) Confirm that the OS startup of the node is completed.
Refer to "Set Up '1.5 Startup Confirmation of OS by Using Remote Console' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup is not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (e).
If the login prompt window is displayed, proceed to the step (e).

(e) Check if the resource group is running normally.
Execute the rgstatus command to confirm whether the resource group is running normally. For the method for confirmation, refer to "Maintenance Tool '2.63 Resource group Status Display (rgstatus)' (MNTT 02-3380)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

(f) After the OS is started on the node, check the following.
Check the hardware status. Check whether the status of 0 of the "Power Supply Information" on the screen is all "ok" (For checking the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.

(g) Return to the step (d) of "Replacement '1.1.2 Replacing the Power Supply Unit/ AC cable (single node configuration) (2) Replacing a power supply unit while the node is turned off' (REP 01-0060)" and execute the rest of the procedures.

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D.1.2 Replacing the Fan Unit

For the cluster configuration, refer to D.1.2.1 Replacing the Fan Unit (cluster configuration).
For the single node configuration, refer to 'D.1.2.2 Replacing the Fan Unit (single node configuration)'.

D.1.2.1 Replacing the Fan Unit (cluster configuration)

(1) Replacement procedure while the node is turned off

(a) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(b) Refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" and replace the fan unit.

NOTE: When you replace a fan unit, follow the instructions in the Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual.

(c) After replacing the fan unit, reconnect the cables where they were if they are all removed at the replacing operation, and then press the power button on the node.

NOTE: When there is an instruction to let the heartbeat cable and maintenance port cable removed during operation, do not connect heartbeat cable and the maintenance port cable and just connect the other cables.

(d) Refer to "Set Up '1.3 Startup Confirmation of the OS by Using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup is not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (e).
If the login prompt window is displayed, proceed to the step (e).

(e) Check whether the OS is completely started on the node. To check, execute the peerstatus command on the other (normal) node and check whether the status is [BOOT COMPLETE].
For details about how to check node status, refer to "Maintenance Tool '2.36 Displaying the Status of Other Side Node (peerstatus)' (MNTT 02-2130)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

(f) After the OS is started on the node, check the following:
Check the hardware status. Check whether "ok" is displayed for all items of "FAN Information" on the screen. For details about how to check the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.
If the above could not be confirmed, perform from step (d) again because there might have incompleteness on the physical connection.

(g) Return to the step (e) of "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)' (REP 01-0070)" and execute the rest of the procedures.

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D.1.2.2 Replacing the Fan Unit (single node configuration)

(1) Replacement procedure while the node is turned off

(a) Stop the OS on the target node.
Before stopping the OS of the node, ask the system administrator if the service can be stopped or not. After that confirmation, execute the operation.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(b) Refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" and execute fan unit replacement.

NOTE: When you replace a fan unit, follow the instructions in the following "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" provided by the hardware vendors.

(c) After the fan unit replacement is completed, in case the replacement operation was performed by removing all the cables, reconnect the cables where they were, and then turn on the power supply button.

(d) Confirm that the OS startup of the node is completed.
Refer to "Set Up '1.5 Startup Confirmation of OS by Using Remote Console' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup is not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (e).
If the login prompt window is displayed, proceed to the step (e).

(e) Check if the resource group is running normally.
Execute the rgstatus command to confirm whether the resource group is running normally. For the method for confirmation, refer to "Maintenance Tool '2.63 Resource group Status Display (rgstatus)' (MNTT 02-3380)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

(f) After the OS is started on the node, check the following.
Check the hardware status. Check whether "ok" is displayed for all items of "FAN Information" on the screen. (For checking the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)')
If the above could not be confirmed, execute the procedure (b) and later again because there might be incompleteness on the physical connection or other reasons.

(g) Return to the step (c) of "Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)' (REP 01-0090)" and execute the rest of the procedures.

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D.1.3 Replacing the Internal Hard Disk Drive

For the cluster configuration, refer to D.1.3.1 Replacing the Internal Hard Disk Drive (cluster configuration).
For the single node configuration, refer to 'D.1.3.2 Replacing the Internal Hard Disk Drive (single node configuration)'.

D.1.3.1 Replacing the Internal Hard Disk Drive (cluster configuration)

Select one of the methods:

NOTE: Replacement of one internal HDD is performed online only, but replacement of two internal HDDs is performed offline only.

Table D.1.3.1-1 Replacing an internal hard disk drive

Method	Node status at replacement	Replacement procedure
1	The node is running. (Replacement of One Internal HDD)	D.1.3.1 (1) Replacement procedures while the node is in operation (replacement of one internal HDD)
2	The node is turned off (for two internal HDDs).	D.1.3.1 (2) Replacement procedures with the power to the node turned off (replacement of two internal HDDs)

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(1) Replacement procedures while the node is in operation (replacement of one internal HDD)

NOTE: Replacement of one internal HDD is performed online only. It cannot be performed offline.

(a) Check whether the SIM message (KAQK37506-E Internal disk drive failure detected (internal_disk_number)) is displayed (Refer to "Maintenance Tool '2.6 Displaying SIMs on This Side (syseventlist)' (MNTT 02-0360)").
Note that "internal_disk_No" in the SIM message and the slot number of internal HDD does not have the relationship, so check the LED of the internal HDD to know the failed HDD.
For the information of LED status, refer "DELLTM PowerEdgeTM R710 Systems Hardware Owner's Manual" provided by the hardware vendor.

(b) Refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" and replace the internal hard disk drive.

NOTE:
- When you replace an internal hard disk drive, follow the instructions in the Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual.
- When removing the internal HDD, in the "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual", there is a description of the direction to prepare for the removal of the drive by using the RAID management software. However, do not perform it because the OS is to be terminated in this operation.

(c) After you replace the internal hard disk drive, check the following:
Check whether the LEDs on the internal hard disk drive light green. For details about the color of the LEDs on an internal hard disk drive, refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual".

Check whether the SIM message (KAQK37507-I Internal disk drive failure recovered (internal_disk_number)) is displayed. For details about how to check messages, refer to "Maintenance Tool '2.6 Displaying SIMs on This Side (syseventlist)' (MNTT 02-0360)".
Check the hardware status. Check whether "ok" is displayed for both 0 and 1 for "Internal HDD Information" on the screen.
For details about how to check the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.
When all the checks are satisfactory, the replacement work is completed.
If any of the above checks is unsatisfactory, follow the instructions in the Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual and perform maintenance.

NOTE: Wait approximately two hours until the new hard disk drive is completely recognized.

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(2) Replacement procedures with the power to the node turned off (replacement of two internal HDDs)

(a) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(b) Refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" and replace the internal hard disk drive.
Leave the power off for the newly OS installation.

NOTE: When you replace an internal hard disk drive, follow the instructions in the Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual.

(c) Install a new OS. For the procedures, refer to "Set Up 'Chapter 3 New Installation' (SETUP 03-0000)".

(d) Perform settings after the installation is completed.
For the setting procedures, refer to "Set Up '5.1 Setting/Confirmation after New Installation' (SETUP 05-0000)".

(e) Restore the OS. For the procedures, refer to "Maintenance Tool '2.8 Recovering the Disk/Cluster Management LU (syslurestore)' (MNTT 02-0460)".

(f) Check whether the OS is completely started on the node. To check, execute the peerstatus command on the other (normal) node and check whether the status is [BOOT COMPLETE].
For details about how to check node status, refer to "Maintenance Tool '2.36 Displaying the Status of Other Side Node (peerstatus)' (MNTT 02-2130)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

(g) After the OS is started on the node, check the following:

- Check whether the LEDs on the internal hard disk drive light green. For details about the color of the LEDs on an internal hard disk drive, refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual".

- Check the hardware status. Check whether "ok" is displayed for both 0 and 1 of "InternalHDD Information" on the screen.
For details about how to check the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.
If any of the above checks is unsatisfactory, repeat from step (a) because there might have incompleteness on the physical connection.

NOTE: The LED blinks while identifying the drive. Wait for approximately two hours until the process of identifying the drive is completed and the LED lights up in green.

(h) Return to the step (f) of "Replacement '1.3.1 Replacing the Internal Hard Disk Drive (cluster configuration) (2) Replacement procedures while the node is turned off (replacement of two internal HDDs)' (REP 01-0130)" and execute the rest of the procedures.

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D.1.3.2 Replacing the Internal Hard Disk Drive (single node configuration)

(1) Replacement procedures while the node is running (replacement of one or two internal hard disk drive(s))

(a) Check whether one of following SIM message is displayed. (Refer to "Maintenance Tool '2.6 Displaying SIMs on This Side (syseventlist)' (MNTT 02-0360)".)

- Check whether (KAQK37506-E Internal disk drive failure detected (internal_disk_number) is displayed.
  Note that, as the SIM message "internal_disk_number" is not related to the slot number of the hard disk drive, confirm the failed part by the LED of the internal hard disk drive.
  For the LED confirmation method, refer to the following "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" provided by the hardware vendor.

- Check if the SIM message of "KAQK37518-E Patrol Read detected an error.(Details: time = xx, code = xx, content = xx, count = xx)" is displayed.
  The slot number of failed internal HDD is displayed as "sX(X is positive integer)" in "content" of the message.
  Replace internal HDD that slot number is displayed.

(b) Refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" and execute internal hard disk drive replacement.

NOTE:
- When you replace an internal hard disk drive, follow the instructions in the following "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" provided by the hardware vendors.
- In following "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" it is described that, when removing the internal hard disk drive, the preparation for removing the drive by using the RAID management software is required, but do not execute the procedure because the OS must be terminated once in this operation.

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(c) After the internal hard disk drive replacement is completed, confirm the following.
Confirm that the LED of the internal hard disk drive lights green. For confirming that the LED of the internal hard disk drive lights green, refer to the following "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual".

Check whether the SIM message (KAQK37507-I Internal disk drive failure recovered(internal_disk_number)) is displayed. (For confirming the message, refer to "Maintenance Tool '2.6 Displaying SIMs on This Side (syseventlist)' (MNTT 02-0360)".
Check the hardware status. Check whether the statuses of 0 to 5 of the "Power Supply Information" on the screen are all "ok" (For checking the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.
If all of the above are true, the replacement operation is completed.
If any one of the above cannot be confirmed, execute the maintenance again following the instructions of the manuals provided by the hardware vendor.

NOTE: In case of a failure in one internal hard disk drive, wait approximately two hours before the drive identification is completed. Meanwhile, in case of replacement of two internal hard disk drives, wait approximately seven hours before the drive identification is completed.

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D.1.4 Replacing the RAID Controller

For the cluster configuration, refer to D.1.4.1 Replacing the RAID Controller (cluster configuration).
For the single node configuration, refer to 'D.1.4.2 Replacing the RAID Controller (single node configuration)'.

D.1.4.1 Replacing the RAID Controller (cluster configuration)

(1) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" and replace the RAID controller.
Turn on the power supply button after the replacement.

NOTE:
- When you replace the RAID controller, follow the instructions in the Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual.
- If the operation requires removing all the cables when you replace the RAID controller, reconnect the cables where they were after the replacing operation.
- When there is an instruction to let the heartbeat cable and maintenance port cable removed during operation, do not connect heartbeat cable and the maintenance port cable and just connect the other cables.

(3) Refer to "Set Up '1.3 Startup Confirmation of the OS by Using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup is not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (4).
If the login prompt window is displayed, proceed to the step (4).

(4) Install a new OS. For the procedures, refer to "Set Up 'Chapter 3 New Installation' (SETUP 03-0000)".

(5) Perform settings after the installation is completed.
For the setting procedures, refer to "Set Up '5.1 Setting/Confirmation after New Installation' (SETUP 05-0000)".

(6) Restore the OS. For the procedures, refer to "Maintenance Tool '2.8 Recovering the Disk/Cluster Management LU (syslurestore)' (MNTT 02-0460)".

(7) Check whether the OS is completely started on the node. To check, execute the peerstatus command on the other (normal) node and check whether the status is [BOOT COMPLETE].
For details about how to check node status, refer to "Maintenance Tool '2.36 Displaying the Status of Other Side Node (peerstatus)' (MNTT 02-2130)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

(8) Return to the step (e) of "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)' (REP 01-0070)" and execute the rest of the procedures.

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D.1.4.2 Replacing the RAID Controller (single node configuration)

(1) Stop the OS on the target node.
Before stopping the OS of the node, ask the system administrator if the service can be stopped or not. After that confirmation, execute the operation.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" and execute RAID controller replacement.

NOTE:
- When you replace a RAID controller, follow the instructions in the following "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" provided by the hardware vendors.
- In case the replacement is to be the operation in which all the cables are removed, reconnect the cables where they were after the replacement.

(3) [In the configuration using trunk 2 Data ports]

Confirm with the system administrator for a free port of the IP-SW configured by the client.
Connect the confirmed free port and the management port of the node by the LAN cable.

[In the configuration using Management port]
This procedure is not required.

(4) Execute the new OS installation. For the method of installation, refer to "Set Up 'Chapter 3 New Installation'(SETUP 03-0000)".

Note that the new OS installation includes the procedure of confirming whether to execute the RAID reconfiguration, execute the reconfiguration.

(5) Execute the setting after the completion of the installation. For the setting method, refer to "Set Up '5.1 Setting/Confirmation after New Installation' (SETUP 05-0000)".

(6) Request the system administrator to restore the system setting information of the node.

(7) Confirm that the OS startup of the node is completed.
Refer to "Set Up '1.5 Startup Confirmation of OS by Using Remote Console' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup is not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (8).
If the login prompt window is displayed, proceed to the step (8).

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(8) Check if the resource group is running normally.
Execute the rgstatus command to confirm whether the resource group is running normally. For the method for confirmation, refer to "Maintenance Tool '2.63 Resource group Status Display (rgstatus)' (MNTT 02-3380)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

(9) [In the configuration using trunk 2 Data ports]
Remove the LAN cable by which the management port of the node and the IP-SW were connected.

[In the configuration using Management port]
This procedure is not required.

(10) Return to the step (c) of "Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)' (REP 01-0090)" and execute the rest of the procedures.

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D.1.5 Replacing the Memory

For the cluster configuration, refer to D.1.5.1 Replacing the Memory (cluster configuration).
For the single node configuration, refer to 'D.1.5.2 Replacing the Memory (single node configuration)'.

D.1.5.1 Replacing the Memory (cluster configuration)

(1) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" and replace the memory.

NOTE: When you replace a memory, follow the instructions in the Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual.

(3) After you replace the memory, reconnect the cables where they were if they are all removed at the replacing operation, and press the power button on the node.

NOTE: When there is an instruction to let the heartbeat cable and maintenance port cable removed during operation, do not connect heartbeat cable and the maintenance port cable and just connect the other cables.

(4) Refer to "Set Up '1.3 Startup Confirmation of the OS by Using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup is not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (5).
If the login prompt window is displayed, proceed to the step (5).

(5) Check whether the OS is completely started on the node. To check, execute the peerstatus command on the other (normal) node and check whether the status is [BOOT COMPLETE].
For details about how to check node status, refer to "Maintenance Tool '2.36 Displaying the Status of Other Side Node (peerstatus)' (MNTT 02-2130)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

(6) After the OS is started on the target node, check the hardware status. Check whether "ok" is displayed for all the memory that is replaced in "Memory Information" on the screen.
For details about how to check the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.
If "ok" is not displayed for any of the memory that is replaced in "Memory Information" on the screen, repeat from step (4) because there might have incompleteness on the physical connection.

(7) Return to the step (e) of "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)' (REP 01-0070)" and execute the rest of the procedures.

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D.1.5.2 Replacing the Memory (single node configuration)

(1) Stop the OS on the target node.
Before stopping the OS of the node, ask the system administrator if the service can be stopped or not. After that confirmation, execute the operation.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" and execute the memory replacement.

NOTE: When you replace a memory, follow the instructions in the following "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" provided by the hardware vendors.

(3) After the memory replacement is completed, in case the replacement operation was performed by removing all the cables, reconnect the cables where they were, and then turn on the power supply button.

(4) Confirm that the OS startup of the node is completed.
Refer to "Set Up '1.5 Startup Confirmation of OS by Using Remote Console' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup is not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (5).
If the login prompt window is displayed, proceed to the step (5).

(5) Check if the resource group is running normally.
Execute the rgstatus command to confirm whether the resource group is running normally.
For the method for confirmation, refer to "Maintenance Tool '2.63 Resource group Status Display (rgstatus)' (MNTT 02-3380)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

(6) After the OS is started on the node, check the hardware status. Confirm whether "ok" is displayed for the status of where the memory replacement was executed on the "Memory Information" on the screen. (For checking the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)')
If the above could not be confirmed, execute the procedure (1) and later again because there might be incompleteness on the physical connection or other reasons.

(7) Return to the step (c) of "Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)' (REP 01-0090)" and execute the rest of the procedures.

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D.1.6 Replacing the Fibre Channel Card

D.1.6.1 Replacing the Fibre Channel Card (cluster configuration)

(1) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".
If the FC card replacement is because of the cluster management LU failure or of the failure on the both paths of the relevant node, execute the nasshutdown command attaching "—force" option to it.
If the host group security mode is set to enable in the configuration of HDI for HCP or in the configuration of HDI for Cloud, perform procedures from step (2).
If the host group security mode is set to disable in the configuration of HDI for Cloud, perform procedures from step (3).

(2) You need to change the WWNs after you replace the Fibre Channel card. Record the WWNs written on the new card.

NOTE:
- The Fibre Channel card has one WWN corresponding to the "PORT 0" and the other WWN corresponding to the "PORT 1", which are written after the "IEEE ADDRESS" in the back of the card. Make sure you clearly identify the WWN of each port.
- Each WWN written on the Fibre Channel card consists of 12 digits and the first four digits (1000) are omitted. Therefore, when you record a WWN, add 1000 at the beginning and make sure the WWN is 16 digits.

(3) Disconnect all the Fibre Channel cables from the Fibre Channel card.

NOTE: After you replace the Fibre Channel card, you need to reconnect the Fibre Channel cables. Record the positions of the cables.

(4) Refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" and replace the Fibre Channel card.
After the replacement, the power source must be stopped because the connection of Fibre Channel cable and the setting of the host group security are required to be set.

NOTE: When you replace the Fibre Channel card, follow the instructions in the Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual.

(5) If the host group security mode is set to enable in the configuration of HDI for HCP or in the configuration of HDI for Cloud, take a note of the WWN of the part removed in step (4).
If the host group security mode is set to disable in the configuration of HDI for Cloud, perform procedures from step (8).

NOTE: Each WWN written on the Fibre Channel card consists of 12 digits and the first four digits (1000) are omitted. Therefore, when you record a WWN, add 1000 at the beginning and make sure the WWN is 16 digits.

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(6) Refer to "LUN Manager User's Guide" and change the WWNs registered for the connection ports in the array. To change the WWNs, delete the WWNs recorded in step (5) and then register the WWNs recorded in step (2).
Note that the Fibre Channel card has two ports. Change the WWN registered for each connection destination port.

(7) After completion of step (6), if the FC-SW is not used, skip this step. If the FC-SW is used, request the system administrator to change the FC-SW WWN zoning by deleting the WWN that you took a note of in step (5) and registering the WWN that you took a note of in step (2).

(8) After you replace the Fibre Channel card and change the WWNs, connect the Fibre Channel cables to the new Fibre Channel card and press the power button on the node. If the cables are all removed at the replacing operation, reconnect them where they were and press the power button on the node.

NOTE: When there is an instruction to let the heartbeat cable and maintenance port cable removed during operation, do not connect heartbeat cable and the maintenance port cable and just connect the other cables.

(9) After the OS is started, log in the node from the maintenance PC. It normally takes approximately 10 minutes until the OS is completely started.

NOTE: You can log in the node from the maintenance PC even if communication with the array was not restored after the FC card replacement. However, in that case, do not execute the commands that affect cluster operation such as clstatus command, etc.

(10) Execute fpstatus command. If "Status" of both paths is "Error", do not execute the rest of the procedures, return to Troubleshooting where you were originally referring to and execute the rest of the procedures there. For the fpstatus command, refer to "Maintenance Tool '2.5 Displaying the FC Status (fpstatus)' (MNTT 02-0280)".

(11) After the OS is started on the node, check the following:
Check the LEDs on the new Fibre Channel card. Make sure at least one port is linked.

(12) When all the checks are completed, obtain the OS log on both nodes.
For details about how to obtain the OS log, refer to "Maintenance Tool '2.19 Collecting Logs (oslogget)' (MNTT 02-1300)".

(13) Check the version of the firmware. For the version confirmation, refer to the version control table (Web). Depending on the version of the firmware, you may need to downgrade the firmware.
For details about how to check the version of firmware, refer to "Maintenance Tool '2.24 Checking the HBA Firmware Version (fchbafwlist)' (MNTT 02-1600)".

(14) When the version of the firmware is appropriate, go to step (16).
If the version of the firmware is inappropriate, downgrade the firmware. For details about how to downgrade firmware, refer to "Maintenance Tool '2.25 Updating the HBA Firmware (fchbafwupdate)' (MNTT 02-1630)".

(15) After you downgrade the firmware, check its version.

(16) Return to the step (e) of "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)' (REP 01-0070)" and execute the rest of the procedures.

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D.1.6.2 Replacing the Fibre Channel Card (single node configuration)

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D.1.7 Replacing the GbE-4Port Card

D.1.7.1 Replacing the GbE-4Port Card (cluster configuration)

(1) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Disconnect all the LAN cables from the GbE-4Port card.

NOTE: You need to reconnect the LAN cables after the replacement work. Record the positions of the LAN cables.

(3) Refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" and replace the GbE-4Port card.
After the replacement, the power source must be stopped because the cables are required to be connected.

NOTE: When you replace the GbE-4Port card, follow the instructions in the Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual.

(4) After replacing the GbE-4Port card, reconnect the cables where they were if they are all removed at the replacing procedure, and press the power button on the node.

NOTE:
- When there is an instruction to let the heartbeat cable and maintenance port cable removed during operation, do not connect heartbeat cable and the maintenance port cable and just connect the other cables.
- Reconnect the LAN cables to the same ports as before.

(5) Refer to "Set Up '1.3 Startup Confirmation of the OS by Using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup is not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (6).
If the login prompt window is displayed, proceed to the step (6).

(6) Check whether the OS is completely started on the node. To check, execute the peerstatus command on the other (normal) node and check whether the status is [BOOT COMPLETE].
For details about how to check node status, refer to "Maintenance Tool '2.36 Displaying the Status of Other Side Node (peerstatus)' (MNTT 02-2130)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

(7) After the OS is started, check the following:
Check the hardware status. Check whether "up" is displayed for the ports used in the new card of "Network Interface" on the screen.
For details about how to check the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.
If the above could not be confirmed, perform from step (4) again because there might have incompleteness on the physical connection.

(8) Return to the step (e) of "Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)' (REP 01-0090)" and execute the rest of the procedures.

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D.1.7.2 Replacing the GbE-4Port Card (single node configuration)

This is not supported for DELL™ PowerEdge™ R710.

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D.1.8 Replacing the GbE-2Port Card

This is not the part of subject for replacement in Dell™ PowerEdge™ R710.

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D.1.9 Replacing the Motherboard

For the cluster configuration, refer to D.1.9.1 Replacing the Motherboard (cluster configuration).
For the single node configuration, refer to 'D.1.9.2 Replacing the Motherboard (single node configuration)'.

D.1.9.1 Replacing the Motherboard (cluster configuration)

NOTE: After replacement of the motherboard, it is necessary to reset the BMC settings. Therefore, check in advance with the system administrator for the BMC interface setting information, and take a note of them.

(1) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Disconnect all the cables from the motherboard.

(3) Refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" and replace the motherboard.
After the replacement, the power source must be stopped because the cables are required to be connected.

NOTE:
- When you replace the motherboard, follow the instructions in the Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual.
- The parts that are removed when replacing the motherboard must be put again where they were after the replacement is completed.
- In replacement of the motherboard, resetting the service tag ID is required. For this reason, execute the replacement linking with the maintenance personnel from the hardware vendor.

(4) After the motherboard replacement is completed, reconnect all cables.

NOTE: When there is an instruction to let the heartbeat cable and maintenance port cable removed during operation, do not connect heartbeat cable and the maintenance port cable and just connect the other cables.

(5) Refer to "Set Up '1.3 Startup Confirmation of the OS by Using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup is not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (6).
If the login prompt window is displayed, proceed to the step (6).

(6) Check the BMC firmware version and set the BMC interface information. For the version confirmation, refer to the version control table (Web).
The version downgrade can be necessary depending on the BMC firmware version.
For the confirmation method of the BMC firmware version, refer to 'B.2.2 BMC Firmware Version Checking Procedure'.
For the method for setting the BMC interface information, refer to "Maintenance Tool '2.18 Setting BMC LAN Information (bmcctl)' (MNTT 02-1210)".

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(7) Set the time of BIOS by any method of the following.

(a) Refer to "Set Up '9.1 UTC-based Time Setting' (SETUP 09-0000)", and acquire the UTC time from the maintenance PC and set the time of BIOS.

(b) Execute the timeget command with the "-u" option specified, in the node that has not been replaced, and set the displayed UTC time for BIOS.
For the timeget command, refer to "Maintenance Tool '2.42 Acquisition of Time/Time Zone (timeget)' (MNTT 02-2430)".
For setting the BIOS time, refer to 'B.2.4 Set the Time in BIOS'.

(8) Update the BIOS if requested by the manufacturer.
For details about how to update the BIOS, refer to "Set Up '7.1 BIOS Update Procedure' (SETUP 07-0000)".

(9) Check whether the OS is completely started on the node. To check, execute the peerstatus command on the other (normal) node and check whether the status is [BOOT COMPLETE].
For details about how to check node status, refer to "Maintenance Tool '2.36 Displaying the Status of Other Side Node (peerstatus)' (MNTT 02-2130)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

(10) Execute the timeget command with no option specified in both nodes, and check that the current time indications are matched in both nodes. Check that the current "year/month/day/hour/minute" indications are the same. For checking the current time, refer to "Maintenance Tool '2.42 Acquisition of Time/Time Zone (timeget)' (MNTT 02-2430)".
If the current time is not matched, take a note of the current time on the node that has not been replaced, and reset the current time on the node that has been replaced by using the timeset command. Note that the reboot is required after setting the time. For setting the current time, refer to "Maintenance Tool '2.43 Time Setting (timeset)' (MNTT 02-2470)".

(11) After completion of step (10), check the following:
Check the hardware statuses on the both nodes to confirm that both the "status" and "connection" of "BMC Information" in the window are "ok". (For checking the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.)
If the above could not be confirmed, perform from step (14) again because there might have incompleteness on the physical connection.

(12) Return to the step (e) of "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)' (REP 01-0070)" and execute the rest of the procedures.

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D.1.9.2 Replacing the Motherboard (single node configuration)

NOTE: The BMC must be reconfigured after the motherboard replacement. Therefore, check the BMC interface information with the system administrator and record the setting information in advance.

(1) Stop the OS on the target node.
Before stopping the OS of the node, ask the system administrator if the service can be stopped or not. After that confirmation, execute the operation.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Remove all the cables connected to the motherboard.

(3) [In case the node is Dell/PowerEdge R710]
Refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" and execute the motherboard replacement.
Note that the cables must be connected after the replacement, turn off the power supply.

NOTE:
- When you replace a motherboard, follow the instructions in the following manuals provided by the hardware vendors.
  [In case the node is Dell/PowerEdge R710]
  Refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual".
- The parts removed in the motherboard replacement must be reinstalled where they were originally installed, after the motherboard replacement.
- As the service tag ID must be reconfigured in motherboard replacement, collaborate with the maintenance personnel of the hardware vendor to execute the operation.

(4) After the motherboard replacement is completed, reconnect all the cables.

(5) Confirm the BMC Firmware version and the BMC interface setting information. For confirming the version, refer to the Version administration table (Web).
Depending on the BMC Firmware version, the version might be required to be downgraded.
As the setting information, set the information recorded before the replacement.
For the confirmation method of the BMC firmware version, refer to 'B.2.2 BMC Firmware Version Checking Procedure'.
For the method for setting the BMC interface information, refer to "Maintenance Tool '2.18 Setting BMC LAN Information (bmcctl)' (MNTT 02-1210)".

(6) Refer to "Set Up '9.1 UTC-based Time Setting' (SETUP 09-0000)", acquire the UTC time from the maintenance PC, and execute the BIOS time setting.

(7) If there is a request from the developer, execute the BIOS update. For the execution method, refer to "Set Up '7.1 BIOS Update Procedure' (SETUP 07-0000)".

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(8) Confirm that the OS startup of the node is completed.
Refer to "Set Up '1.5 Startup Confirmation of OS by Using Remote Console' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup is not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (9).
If the login prompt window is displayed, proceed to the step (9).

(9) Check if the resource group is running normally.
Execute the rgstatus command to confirm whether the resource group is running normally. For the method for confirmation, refer to "Maintenance Tool '2.63 Resource group Status Display (rgstatus)' (MNTT 02-3380)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

(10) After (9) is completed, check the following.
Check the hardware status on the node. Check whether the status of the " BMC Information" on the screen is "ok" (For checking the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)')
If the above could not be confirmed, execute the procedure (1) and later again because there might be incompleteness on the physical connection or other reasons.

(11) Return to the step (c) of "Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)' (REP 01-0090)" and execute the rest of the procedures.

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D.1.10 Replacing the DVD Drive

For the cluster configuration, refer to D.1.10.1 Replacing the DVD Drive (cluster configuration).
For the single node configuration, refer to 'D.1.10.2 Replacing the DVD Drive (single node configuration)'.

D.1.10.1 Replacing the DVD Drive (cluster configuration)

(1) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" and replace the DVD drive.

NOTE: When you replace the DVD drive, follow the instructions in the Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual.

(3) After you replace the DVD drive, reconnect the cables where they were if they are all removed at the replacing operation, and press the power button on the node.

NOTE: When there is an instruction to let the heartbeat cable and maintenance port cable removed during operation, do not connect heartbeat cable and the maintenance port cable and just connect the other cables.

(4) Confirm that the OS startup of the node is completed.
Refer to "Set Up '1.3 Startup Confirmation of the OS by Using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup is not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (5).
If the login prompt window is displayed, proceed to the step (5).

(5) Check whether the OS is completely started on the node. To check, execute the peerstatus command on the other (normal) node and check whether the status is [BOOT COMPLETE].
For details about how to check node status, refer to "Maintenance Tool '2.36 Displaying the Status of Other Side Node (peerstatus)' (MNTT 02-2130)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

(6) Return to the step (e) of "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)' (REP 01-0070)" and execute the rest of the procedures.

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D.1.10.2 Replacing the DVD Drive (single node configuration)

(1) Stop the OS on the target node .
Before stopping the OS of the node, ask the system administrator if the service can be stopped or not. After that confirmation, execute the operation.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" and execute the DVD drive replacement.

NOTE: When you replace a DVD drive, follow the instructions in the following manuals provided by the hardware vendors.
[In case the node is Dell/PowerEdge R710]
Refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual".

(3) After the DVD drive replacement is completed, in case the replacement operation was performed by removing all the cables, reconnect the cables where they were, and then turn on the power supply button.

(4) Confirm that the OS startup of the node is completed.
Refer to "Set Up '1.5 Startup Confirmation of OS by Using Remote Console' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup is not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (5).
If the login prompt window is displayed, proceed to the step (5).

(5) Check if the resource group is running normally.
Execute the rgstatus command to confirm whether the resource group is running normally. For the method for confirmation, refer to "Maintenance Tool '2.63 Resource group Status Display (rgstatus)' (MNTT 02-3380)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

(6) Return to the step (c) of "Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)' (REP 01-0090)" and execute the rest of the procedures.

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D.1.11 Replacing the CPU

Refer to ‘D.1.9 Replacing the Motherboard’, and execute the replacement of motherboard.
When replacing motherboard in reference to “DELL™ PowerEdge™ R710 Systems Hardware Owner’s Manual” during operation, execute in accordance with the instruction of (HDS).

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D.1.12 Replacing the HDD Backplane board

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D.1.13 Replacing the Front Panel Board

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D.1.14 Replacing the PS Backboard

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D.1.15 Replacing the Lithium Battery

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D.1.16 Replacing the PCI Riser Board

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D.1.17 Replacing the CPU Heatsink

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D.1.18 Replacing the CPU Air Duct

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D.1.19 Replacing the Cable

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D.1.20 Replacing the BMC

For the cluster configuration, refer to D.1.20.1 Replacing the BMC (cluster configuration).
For the single node configuration, refer to 'D.1.20.2 Replacing the BMC (single node configuration)'.

D.1.20.1 Replacing the BMC (cluster configuration)

NOTE: After the replacement of BMC, it is necessary to check whether the BMC setting information has not been changed. Therefore, check in advance with the system administrator for the BMC interface setting information, and take a note of them.

(1) Stop the OS on the target node. For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" and replace the BMC.

NOTE:
- When you replace the BMC, follow the instructions in the Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual.
- If the operation requires removing all the cables when you replace the RAID controller, reconnect the cables where they were after the replacing operation.
- When there is an instruction to let the heartbeat cable and maintenance port cable removed during operation, do not connect heartbeat cable and the maintenance port cable and just connect the other cables.

(3) Turn on the power supply button.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup is not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (4).
If the login prompt window is displayed, proceed to the step (4).

(4) Check the BMC firmware version and the BMC interface setting information.
For the version confirmation, refer to the version control table (Web).
The version downgrade may be necessary depending on the BMC firmware version.
Compare the setting information after the replacement with the one that you took a note before the replacement to check that there is no change. If there is any change, reset the setting information that you took a note before replacement.
For the confirmation method of the BMC firmware version, refer to 'B.2.2 BMC Firmware Version Checking Procedure'.
For the method for setting the BMC interface information, refer to "Maintenance Tool '2.18 Setting BMC LAN Information (bmcctl)' (MNTT 02-1210)".

(5) After you complete step (6), press the power button on the node if the power indicator is off.

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(6) Check whether the OS is completely started on the node. To check, execute the peerstatus command on the other (normal) node and check whether the status is [BOOT COMPLETE].
For details about how to check node status, refer to "Maintenance Tool '2.36 Displaying the Status of Other Side Node (peerstatus)' (MNTT 02-2130)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

(7) After the OS is started on the node, check the following:
Check the hardware status on both nodes. Check whether "ok" is displayed for "status" and "connection" for "BMC Information" on the screen. For details about how to check the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.
If the above could not be confirmed, perform from step (1) again because there might have incompleteness on the physical connection.

(8) Return to the step (e) of "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)' (REP 01-0070)" and execute the rest of the procedures.

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D.1.20.2 Replacing the BMC (single node configuration)

NOTE: After the replacement of BMC, it is necessary to check whether the BMC setting information has not been changed. Therefore, check in advance with the system administrator for the BMC interface setting information, and take a note of them.

(1) Stop the OS on the target node.
Before stopping the OS of the node, ask the system administrator if the service can be stopped or not. After that confirmation, execute the operation.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Refer to "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" and execute the BMC replacement.

NOTE:
- When you replace a BMC, follow the instructions in the following "Dell™ PowerEdge™ R710 Systems Hardware Owner's Manual" provided by the hardware vendors.
- In case the replacement operation is performed by removing all the cables, reconnect the cables where they were.

(3) Confirm OS boot completion of the node.
Refer to "Set Up '1.5 Startup Confirmation of OS by using Remote Console' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup is not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (4).
If the login prompt window is displayed, proceed to the step (4).

(4) Check if the resource group is running normally.
Execute the rgstatus command to confirm whether the resource group is running normally.
For the method for confirmation, refer to "Maintenance Tool '2.63 Resource group Status Display (rgstatus)' (MNTT 02-3380)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

(5) Confirm the BMC Firmware version and the BMC interface setting information. For confirming the version, refer to the Version administration table (Web).
Depending on the BMC Firmware version, the version might be required to be downgraded.
Compare the setting information with the information recorded before the replacement and confirm that no change is made. If there is any change, reset the information recorded before the replacement.
For the confirmation method of the BMC firmware version, refer to 'B.2.2 BMC Firmware Version Checking Procedure'.
For the method for setting the BMC interface information, refer to "Maintenance Tool '2.18 Setting BMC LAN Information (bmcctl)' (MNTT 02-1210)".

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(6) After the completion, if the power supply indicator is off, turn on the power supply button.

(7) After the OS is started on the node, check the following.
Check the hardware status on the node. Check whether the status of the "BMC Information" on the screen is "ok" (For checking the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)')
If the above could not be confirmed, perform from step (1) again because there might be incompleteness on the physical connection or other reasons.

(8) Return to the step (c) of "Replacement '1.2.2 Parts replacement only when the node is turned off (single node configuration)' (REP 01-0090)" and execute the rest of the procedures.

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D.1.21 Replacing the Management Port

Refer to ‘D.1.9 Replacing the Motherboard’, and execute the replacement of motherboard.

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D.1.22 Replacing the Internal RAID Battery

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D.1.23 Replacing the USB Board

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D.1.24 Replacing the SFP module

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CONTENTS

D.2 Appendix.A A Node Replacement Procedure

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D.2 Appendix.A A Node Replacement Procedure

Dell™ PowerEdge™ R710 does not support the procedure that replaces one node.

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